DEPARTMENT OF THE ARMY
Omaha District, Corps of Engineers
106 South 15th Street
Omaha, Nebraska 68102-1618

:NOTICE: Failure to acknowledge : :all amendments may cause rejec- : :tion of the offer. See FAR : :52.215-1 of Section 00100 :	Solicitation No. W9128F 04 R 0003 Date of Issue: 21 JAN 2003 **Date of Receiving Proposals: 10 MAR 2004**

Amendment No. 0003
27 February 2004

SUBJECT: **Amendment No. 0003** to Request for Proposal Solicitation Package for Construction of **FY04 ADAL USAF HOSPITAL at USAF ACADEMY, COLORADO.**
Solicitation No. W9128F 04 R 0003

TO: Prospective Offerors and Others Concerned

1. The specifications and drawings for subject project are hereby modified as follows (revise all specification indices, attachment lists, and drawing indices accordingly).

a. Specifications. (Descriptive Changes.)

(1) Section 02315A, at the end of this section, insert the attached Geotechnical Engineering Study.

(2) Section 13120, Page 5, paragraph 1.4, under the description requirements for SD-04 Samples submittal item labeled “Samples”, add:

“The Contractor shall provide a copy of the manufacturer’s full range of standard colors (not less than 8 color selections) for each finish item for selection by the Contracting Officer.”

(3) Section 13120, Page 8, paragraph 2.3, below item e. Domestic hot water system, insert:

“f. Medical Gas Systems. Refer to Floor Plans, Sheets A19-1 through A19-3 for extent of medical gas outlet devices. Refer to Equipment Schedule, Sheets A3-1 through A3-3 for definitions of devices and required gases. Provide a complete system of piped medical gases to provide minimum requirements based on outlet quantities”.

(4) Section 13280A, at the end of this section, insert the attached Setup Detail and Response Action Detail Sheets, and the Hazardous Materials Pre-Renovation Inspections Report.

(5) Section 13720A, Page 4, under “PART 1 GENERAL”, insert:

“The requirements of this section will be provided as a Government-Furnished/Government-Installed system, except for the electrical conduit and pull wires that are required to supply power and

communications to this system. Contractor shall be required to coordinate the scheduling of his work and installation of the GFCI system with the Contracting Officer."

(6) Section 15405A, Page 54, Table I, Item No. 2, insert an "X" under Service Condition E column.

b. Specifications (New and/or Revised and Reissued).
NOT APPLICABLE.

c. Drawings (Not Reissued). The following sheets of drawing code AF 510-10-01 are revised as indicated below with latest revision date of 27 February 2004. These drawings are not reissued with this amendment.

(1) Sheet T1-2.1, SITE LOCATION PLAN, Detail 7 references, sheets where detail is shown, delete "C-5" and "C-9" and substitute "C-10" (2 locations).

(2) Sheet S2-4, NOTES, following note 3, add:

"4. EXISTING FLOOR LEVEL SLOPES FROM 1-INCH BELOW FF TO 1 FOOT – 1 INCH BELOW FF."

(3) Sheet A4-3, FINISH SCHEDULE, Room 1E17A, all WALLS, wall material and color, delete "CT" and "CT-3" and substitute "GWL" and "PT-1", respectively.

(4) Sheet A4-5, FINISH SCHEDULE, Rooms 1NC1 and 1NC2, BASE, Base material and color, delete "RB" and "RB-1" and substitute "GPB" and "GP-2", respectively.

(5) Sheet A4-6, FINISH SCHEDULE, Room 1SC1, WALLS, West wall material and color, delete "EXT" and "MBL" and substitute "ETRP" and "PT-1", respectively.

(6) Sheet MO-1, GENERAL NOTES, following note 12, add:

"13. WHERE CORROSIVE RESISTANT STEEL (CRS) DUCT IS INDICATED ON THE DRAWINGS FOR SUPPLY AND RETURN DUCTS IT SHALL BE STAINLESS STEEL OR ALUMINUM. WHERE INDICATED FOR HOOD EXHAUST DUCTS ON THE DRAWINGS IT SHALL BE STAINLESS STEEL ONLY."

(7) Sheet E4-1, LIGHT FIXTURE SCHEDULE.

(a) Fixtures C2 and J5, under OPTIONS column, delete "DIMMING BALLAST".
(b) Fixtures C3 and J6, under OPTIONS column, add "DIMMING BALLAST".

2. This amendment is a part of the proposing papers and its receipt shall be acknowledged on the Standard Form 1442. All other conditions and requirements of the specifications remain unchanged. If the proposals have been mailed prior to receiving this amendment, you will notify the office where proposals are received, in the specified manner, immediately of its receipt and of any changes in your proposal occasioned thereby.

a. Hand-Carried Proposals shall be delivered to the U.S. Army Corps

of Engineers, Omaha District, Contracting Division (Room 301), 106 South 15th Street, Omaha, Nebraska 68102-1618.

b. Mailed Proposals shall be addressed as noted in Item 8 on Page 00010-1 of Standard Form 1442.

3. Offers will be received until 1:00 p.m., local time at place of receiving proposals, 10 March 2004.

Attachments:
Geotechnical Engineering Study (Attachment to Section 02315A [23 pages]
Setup Detail and Response Action Detail Sheets [33 Pages], and the Hazardous Materials Pre-Renovation Inspections Report [111 Pages] (Attachments to Section 13280A)

U.S. Army Engineer District, Omaha
Corps of Engineers
106 South 15th Street
Omaha, Nebraska 68102-1618

27 FEB 2004
DRL/4547

Kumar & Associates, Inc.
Geotechnical and Materials Engineers
and Environmental Scientists

3015 Pennsylvania Avenue
Colorado Springs, CO 80907
(719) 632-7009 • Fax (719) 632-1049
E-Mail: kacolospgs@kumarusa.com
Web: www.kumarusa.com

Office Locations: Denver, Colorado, Fort Collins, Colorado
Branch Office: Pueblo, Colorado

GEOTECHNICAL ENGINEERING STUDY
PROPOSED HOSPITAL ADDITIONS
UNITED STATES AIR FORCE ACADEMY, COLORADO

Prepared by:

Duane P. Craft, E.I.T.

Reviewed by:
Bruce Berends, P.E.

Prepared for:

SHERLOCK, SMITH AND ADAMS, INC.
3047 CARTER HILL ROAD
MONTGOMERY, ALABAMA 36111

ATTN: MR. DAVID COOPER, P.E.

Project No. 022-138

June 6, 2002

TABLE OF CONTENTS

SUMMARY

1. The subsoil conditions encountered in the exploratory borings generally consisted of nil to approximately 15 feet of sandy gravel to gravelly sand fill underlain by native gravelly sand and sandy gravel to depths ranging from approximately 1 to 28 feet. In seven of the borings, sandstone bedrock was encountered at depths ranging from approximately 1 to 28 feet and extending to the maximum 20- to 40-foot depth drilled. Ground water was encountered in three of the borings at the time of drilling at depths ranging from approximately 22 to 37 feet below the existing grade.

2. We recommend proposed interior building additions be supported on shallow spread footings bearing on the native soils and/or properly compacted structural fill. Spread footings may be designed for an allowable bearing pressure of 1,500 psf.

3. We recommend footings bearing on the sandstone bedrock or native soils be used to support the proposed exterior building additions. Footings may be designed for an allowable bearing pressure of 8,000 psf.

4. For the proposed parking lot extension, we recommend the pavement section consist of 7 inches of full depth asphaltic concrete. As an equivalent alternate, 5.5 inches of asphaltic concrete over 6 inches of aggregate base course may be used.

PURPOSE AND SCOPE OF STUDY

This report presents the results of a geotechnical engineering study for the proposed expansion of the existing Air Force Academy Hospital Building. The project site is shown on the attached Figure 1. The subsurface study was conducted in accordance with our proposals dated December 28, 2001, and April 9, 2002, to develop foundation and paving recommendations for the proposed building additions and parking lot.

This report has been prepared to summarize the data obtained during this study, and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to the proposed construction are included herein.

PROPOSED CONSTRUCTION

We understand the proposed construction will consist of an approximate 95x180-foot addition at the south side of the existing building, an approximately 55x110-foot MRI/CT

scan addition at the east side of the building, and a 7,000-square-foot in-fill of the existing interior courtyards. Each addition will be one-story, and will not have a basement. Steel-frame and precast-concrete-panel construction with slab-on-grade floors matching the existing first floor elevation of 7160.3 feet are proposed. We also understand the east addition will have an additional 8-inch-thick concrete masonry block lining around the interior perimeter of the precast-concrete walls. Anticipated building loads include column loads of approximately 21 kips for the exterior south addition and interior addition, and 24 kips for the exterior east addition. Based on the site plan provided, we have estimated site grading at the south addition will require cuts up to approximately 10 feet in depth, and fill depths up to approximately 5 feet. At the east addition, we have estimated fill depths up to approximately 6 feet will be required.

An "L" shaped cantilevered retaining wall with a height ranging from approximately 5 to 15 feet and a length of approximately 155 feet will be constructed near the southeast corner of the south addition.

The existing parking lot on the west side of the building will be extended to the south approximately 65 feet, and will occupy the area which currently contains Building 4106.

If loadings, locations or conditions are significantly different from those described above or depicted in this report, we should be notified to reevaluate the recommendations contained in this report.

SITE CONDITIONS

At the time of our visit, an irrigated landscaped area occupied the proposed addition site on the south side of the existing 4-story hospital. A retaining wall ranging to approximately 6 feet in height extends approximately 55 feet south of the existing structure within the footprint of the proposed south addition. The wall is retaining on the east. A steep south facing slope with an approximate grade of 27% bounds the landscaped area approximately 80 to 100 feet south of the southern wall of the existing building. The landscaped areas contained planted grass, shrubs and pine trees.

An asphalt-paved access drive and concrete sidewalks occupied the east side of the existing building. East of the access drive, a moderately steep, easterly facing slope with an approximate 27% grade is present, approximately 35 feet from the east side of the existing building.

The interior courtyard was located at ground level of the first floor of the hospital. The courtyard was irrigated and landscaped with grass. Occasional tree stumps were present.

The parking lot area was relatively flat to gently sloping to the northeast. The existing Building 4106 with perimeter sidewalks was located within the proposed parking lot area. An existing asphalt-paved parking area was located immediately north of the proposed parking lot expansion area. The land south and east of the site appeared to be native forest vegetated with of large pine trees and scrub oak trees, grasses and weeds.

SUBSURFACE CONDITIONS

Information on subsurface conditions at the site was obtained by drilling twelve exploratory borings at the approximate locations shown on Figure 1. The borings drilled for the exterior building additions and parking lot were advanced through the overburden soils and underlying bedrock with a truck mounted 4-inch diameter continuous flight auger. The borings drilled for the interior in-fill addition were advanced with a 4-inch diameter hand auger. Logs of the borings are presented on Figures 2 and 3. Selected samples obtained from the borings were tested in the laboratory to obtain information on pertinent geotechnical engineering properties. Laboratory test results are presented on Figures 2 through 7, and are summarized in Table I. The laboratory testing was conducted in general accordance with applicable ASTM standards. The following subsurface descriptions are of a generalized nature to highlight the major stratification features encountered in the borings. The boring logs should be referenced for more detailed information.

Sandy gravel to gravelly sand fill with occasional cobbles was encountered in Borings 3, and 5 through 11. In the courtyard, Borings 8 through 11, the fill was encountered to the

maximum 5-foot depth explored. The remaining four borings encountered fill to depths ranging from approximately 10 to 15 feet. Practical auger drilling refusal in the fill was encountered in the cobbles in Boring 5. Our study did not determine the exact lateral or vertical extent of the fill.

Native gravelly sand and sandy gravel with occasional cobbles was encountered at the surface or below the existing fill in each of the borings drilled in the exterior of the hospital. The native soils extended to depths ranging from approximately 1 to 28 feet in the proposed exterior addition borings, and to the maximum 5-foot depth of the proposed parking lot boring. Practical auger drilling refusal was encountered in the cobbles in Boring 6. Sampler penetration blow counts indicate the native soils are medium dense to very dense.

Noncemented sandstone bedrock was encountered beneath the native soils in each of the borings drilled within the exterior addition footprints, and extended to the maximum 20- to 40-foot depths explored. Sampler penetration blow counts indicate the bedrock is very hard in consistency.

Ground water was encountered in Borings 5, 6 and 7 at the time of drilling at depths ranging from approximately 22 to 37 feet below the existing grade. Fluctuations in the water level may occur with time.

FOUNDATION RECOMMENDATIONS

Exterior Additions: Considering the subsurface conditions encountered in the exploratory borings and the nature of the proposed construction, we recommend the proposed exterior building additions be supported on footings bearing on the sandstone bedrock and/or the undisturbed native granular soils below the fill. Foundations extending below the fill may be constructed by excavating down to the bedrock or native granular soils and then forming footings using conventional techniques. Alternatively, the foundations may be constructed as drilled footings bearing on the bedrock or native granular soils. It is generally preferred to place foundations on materials of similar stiffness in order to reduce

granular soils combined with our relatively conservative recommended bearing pressures, we anticipate differential foundation movements should be within normal limits.

The existing fill encountered contained zones that were relatively noncompact; therefore, this fill is unsuitable for support of foundations. Shallow foundations placed directly on the existing fill could be subjected to potentially large total and differential settlement causing structural distress. Additionally, the fill encountered was relatively deep, and as a result it appears impractical to remove and replace all of the fill. Straight-shaft piers drilled into bedrock were also considered; however, they are expected to be difficult and costly to construct because of the relatively great depth to bedrock at some locations, and due to the presence of cobbles in the overburden soils and groundwater at the bedrock surface.

The design and construction criteria presented below should be observed for a spread-footing foundation system. The construction details should be considered when preparing project documents.

1. Footings bearing on the bedrock or undisturbed native granular soils may be designed for an allowable bearing pressure of 8,000 psf.
2. Footings bearing on the undisturbed native granular soils should bear at a depth of at least 4 feet below the lowest adjacent grade. The minimum bearing depth may be reduced to 2.5 feet for footings supported on the sandstone bedrock.
3. Footings should have a minimum width of 36 inches.
4. Based on the results of our field exploration, laboratory testing, analysis and our experience with similar, properly constructed footings, we estimate the settlement of footings will not exceed approximately ½ inch when designed according to the criteria presented herein. The settlement will be differential with respect to the existing construction; plan details should provide for this potential differential movement.
5. The lateral resistance of a spread footing placed on undisturbed bedrock or natural soils will be a combination of the sliding resistance of the footing on the foundation materials and passive earth pressure against the side of the footing. Resistance to

sliding at the bottoms of the footings may be calculated based on an allowable coefficient of friction of 0.3. Passive pressure against the sides of the conventional footings or drilled footings may be calculated using an allowable equivalent fluid unit weight of 225 pcf. New compacted fill placed against the sides of the footings to resist lateral loads should be a nonexpansive granular material. Fill should be placed and compacted to at least 90% of the maximum modified Proctor density (ASTM D1557) at a moisture content near optimum.

6. Granular foundation soils should be compacted with a smooth vibratory compactor prior to placement of concrete.

7. Drilled footing excavations should be properly cleaned prior to placement of concrete. Any loosened soils in the bottom of the drilled excavations should be removed or compacted in place.

8. Large gravel and cobbles were encountered in the exploratory borings. These conditions may complicate the drilling process, including affecting plumbness, causing oversize shaft diameters, and reducing the effectiveness of or preventing seating of the casing near the bedrock surface. The drilled shaft contractor should be aware of this information and be prepared for these conditions during pier installation.

9. A representative of the geotechnical engineer should observe all drilling operations for drilled footings on a full-time basis to assist in identification of adequate bearing material and to monitor construction procedures. All footing excavations should be observed prior to concrete placement.

Interior Additions: Considering the subsurface conditions encountered, we recommend the courtyard in-fill addition be supported by spread-footing foundations bearing on native soils and/or properly compacted structural fill. Fill was encountered in each of the borings drilled within the courtyard, and the conditions of fill placement are unknown. However, based on the location and the field and laboratory test results, we believe the fill was probably compacted relatively well. Therefore, it is our opinion footings may be placed directly on the fill if in-place testing at the time of construction confirms the fill has adequate density and if the footings are designed for a relatively low bearing pressure to reduce total and differential settlements.

The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents.

1. Footings placed on native soils and/or properly compacted structural fill should be designed for an allowable soil bearing pressure of 1,500 psf.
2. We estimate total settlement for footings designed and constructed as discussed in this section will not exceed 1 inch. We anticipate the majority of foundation settlement will occur during construction. The settlement will be differential with respect to the existing construction; plan details should provide for this differential movement.
3. In-place density testing should be performed at the time of construction to evaluate the degree of compaction of the existing fill. Any noncompact fill or areas of soft material and/or deleterious substances encountered within the foundation excavations should be removed and the footings extended down to adequate bearing material. As an alternate, these materials may be removed and replaced with structural fill material compacted to at least 93% of the maximum modified Proctor density (ASTM D 1557) near the optimum moisture content. New fill should extend down from the edges of the footings at a 1 horizontal to 1 vertical projection.
4. We recommend structural fill be a minus 3-inch material with a maximum of 30% passing the No. 200 sieve, a maximum liquid limit of 30, and a maximum plasticity index of 10. With the exception of the oversized material encountered, the tested samples of on-site soil meet these criteria. The geotechnical engineer should approve any proposed fill material prior to placement.
5. Spread footings placed on granular soils should have a minimum width of 16 inches for continuous footings and 24 inches for isolated pads.
6. Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 30 inches below the exterior grade is typically used in this area.

6. Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 30 inches below the exterior grade is typically used in this area.
7. Continuous foundation walls should be reinforced top and bottom to span an unsupported length of at least 10 feet.
8. Granular foundation soils should be compacted with a smooth vibratory compactor prior to placement of concrete.
9. Excavation of cobbles from near the foundation bearing level may cause loosening of the surrounding granular soils. Any areas of loose or disturbed soils encountered within the foundation excavation should be removed and replaced with structural fill.
10. A representative of the geotechnical engineer should observe all footing excavations prior to fill and concrete placement.

SEISMIC SITE CLASS

The proposed building additions should be designed using a soil profile type S_C in accordance with IBC 2000 Section 1615.1.5.

FLOOR SLABS

The native on-site soils and sandstone bedrock, exclusive of topsoil, are suitable to support lightly to moderately loaded slab-on-grade construction. It appears fill will be present below floor slab elevations in all three additions. As previously discussed under "Foundation Recommendations, Interior Additions," it appears the fill in the courtyard area is relatively compact. Subject to confirmation of adequate density, we believe these soils in the courtyard are suitable to support lightly to moderately loaded slab-on-grade construction. The fill encountered in the south addition also appears to be relatively compact. However, because of the thickness of this fill, we recommend some overexcavation and replacement of fill encountered below floor slab levels in the south addition. The low sampler penetration blow counts encountered in a significant portion of the fill in the east addition suggest much of this fill is noncompact. Therefore, we recommend all of the existing fill below floor slabs in this structure be removed and replaced with new structural fill, or that the fill be left in place and a structural floor be used. If the potential for some slab settlement and distress

1. If slab-on-grade construction is to be used for the east addition, the upper three feet of existing fill beneath the building footprint should be overexcavated prior to placing new fill for support of floor slabs. For the south addition, all existing fill present within three feet below slab level should be removed and replaced with new structural fill. Prior to placing fill for support of floor slabs in the courtyard area, in place density testing should be performed to evaluate the degree of compaction of the existing fill. Any fill of inadequate density identified by the testing should be overexcavated to a depth of three feet below slab level and replaced with new structural fill.
2. Fill material placed beneath floor slabs should meet the requirements of structural fill as defined under "Foundation Recommendations, Interior Additions." The geotechnical engineer should evaluate the suitability of proposed fill materials prior to placement. Fill placed for support of floor slabs should be compacted to at least 90% of the modified Proctor maximum dry density at a moisture content near optimum.
3. To reduce the effects of some differential movement, floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement.
4. Floor slab control joints should be used to reduce damage due to shrinkage cracking. Joint spacing is dependant on slab thickness, concrete aggregate size, and slump, and should be consistent with recognized guidelines such as those of the Portland Cement Association (PCA) and American Concrete Institute (ACI). The joint spacing and slab reinforcement should be established by the designer based on experience and the intended slab use.
5. If moisture-sensitive floor coverings will be used, mitigation of moisture penetration into the slabs such as by use of a vapor barrier may be required. If an impervious vapor barrier membrane is used, special precautions will be required to prevent differential curing problems which could cause the slabs to warp. A minimum 3-inch sand layer between the concrete and the vapor barrier is sometimes used for this purpose.

sand layer between the concrete and the vapor barrier is sometimes used for this purpose.

6. All plumbing lines should be tested before operation. Where plumbing lines enter through the floor, a positive bond break should be provided. Flexible connections should be provided for slab-bearing mechanical equipment.

RETAINING WALLS

Assuming materials consisting of the undisturbed natural granular soils or compacted granular structural fill, the following parameters may be used for design of earth retaining walls:

$$\phi = 33^{\circ}$$

$$\gamma = 125 \text{ pcf}$$

$$K_a = 0.3$$

$$K_o = 0.5$$

$$K_p = 3.4$$

Granular structural fill should meet the requirements for Class 1 backfill in accordance with the Colorado Department of Transportation "Standard Specifications for Road and Bridge Construction," or should classify an A-1-a in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Classification System. It appears some of the on-site soils meet these criteria.

The retaining wall design should account for the surcharge pressures imposed by the structure above the wall. In addition, the effect of the slope below the base of the wall on bearing capacity and global stability should be analyzed.

There are mechanically stabilized earth (MSE) wall systems available which may be suitable for the proposed construction. Wall systems using welded wire mesh for reinforcement can be constructed with precast concrete facia units constructed to match the on-site concrete. We can provide the names of design/build contractors for these wall systems if required.

WATER SOLUBLE SULFATES

The concentrations of water soluble sulfates measured in samples obtained from the exploratory borings were less than 0.02%. These concentrations of water soluble sulfates represent a negligible degree of sulfate attack on concrete exposed to these materials. The degree of attack is based on a range of negligible, positive, severe and very severe as presented in the U.S. Bureau of Reclamation Concrete Manual. Based on this information, we believe special sulfate resistant cement will not be required for concrete exposed to the on-site soils.

SURFACE DRAINAGE

The following drainage precautions should be observed during construction and maintained at all times after construction.

1. Excessive wetting or drying of the foundation excavations and underslab areas should be avoided during construction.
2. Exterior backfill should be adjusted to a moisture content near optimum and compacted to at least 90% of the maximum modified Proctor density in pavement areas and to at least 85% of the maximum modified Proctor density in landscape areas.
3. The ground surface surrounding the exterior of the building should be sloped to drain away from the foundation in all directions. We recommend a minimum slope of 6 inches in the first 10 feet in unpaved areas and minimum slope of 2.5 inches in the first 10 feet in paved areas.
4. Roof downspouts and drains should discharge well beyond the limits of all backfill.
5. Excessive landscape irrigation should be avoided within 10 feet of the foundation walls.

PAVEMENT DESIGN

Subgrade Materials: The subgrade soils encountered in the parking lot boring classify as A-1-a with group index of 0 in accordance with the AASHTO Classification System. The subgrade soils belong to the F1 and F2 frost groups as defined by AFM 88-7, Chapter 1, "Pavement Design for Roads, Streets, Walks, and Open Storage Areas", (June 1992).

California Bearing Ratio (CBR) test results are presented on Figures 6 and 7, and indicate a CBR value of 51 for the tested subgrade sample at a density corresponding to 95% of the maximum modified Proctor density.

Design Traffic: Because anticipated traffic loading information was not available at the time of report preparation, we assumed Category I traffic (traffic containing primarily passenger cars, panel and pickup trucks, but containing not more than 1 percent two-axle trucks), and Road Class F (70 to 210 vehicles per day) in accordance with the criteria given in AFM 88-7, Chapter 1 for the proposed parking lot.

A Design Index of 6.5 was determined from these assumptions. The traffic assumptions made in this report should be verified after the design traffic loading information becomes available.

Pavement Sections: Pavement sections were determined in accordance with AFM 88-7, Chapter 1. Based on the results of the analysis, we recommend the new pavement section consist of 7 inches of full depth asphaltic concrete. As an equivalent alternate, 5.5 inches of asphaltic concrete over 6 inches of aggregate base course may be used.

The asphaltic concrete pavement should consist of a bituminous material which meets the requirements of AFM 88-6, Chapter 9, "Bituminous Pavement Standard Practice." The asphalt cement should be AC-10 grade. Aggregate base course should meet the requirements of AFM 88-7, Chapter 1.

Subgrade Preparation: Prior to placing the new pavement sections, the subgrade should be scarified to a depth of 8 inches, adjusted to a moisture content near optimum and compacted to 95% of the maximum modified Proctor density (ASTM D1557) at a moisture content near optimum. The pavement subgrade should be proofrolled with a heavily loaded pneumatic-tired vehicle. Pavement design procedures assume a stable subgrade. Areas which deform under heavy wheel loads are not stable and should be removed and replaced to achieve a stable subgrade prior to paving.

Drainage: The collection and diversion of surface drainage away from paved areas is extremely important to the satisfactory performance of the pavement. Drainage design should provide for the removal of water from paved areas and prevent the wetting of the subgrade soils.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings drilled at the locations indicated on Figure 1 and the proposed type of construction. The nature and extent of subsurface variations across the site may not become evident until excavation is performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, this office should be advised at once so reevaluation of the recommendations may be made. We recommend on-site observation of excavations by a representative of the geotechnical engineer.

DPC:sp

N

30 0 30 60

SCALE–FEET

EXISTING HOSPITAL BUILDING

BORING 9

BORING 11

EXISTING COURTYARDS

BORING 10

PROPOSED COURTYARD "IN–FILL"

BORING 8

PROPOSED EAST ADDITION

BORING 7

BORING 6

BORING 5

BUILDING 4104
1–STORY CONCRETE
F.F. ELEV. = 7140.17

EXISTING
PARKING LOT

AREA OF
PROPOSED
PARKING LOT

BORING 12

EXISTING BUILDING
4106

BUILDING 4105
1–STORY WOOD
F.F. ELEV. = 7168.40

EXISTING HOSPITAL BUILDING

BUILDING 4103
F.F. ELEV. = 7142.51

LOADING DOCK
F.F. ELEV. = 7143.38

BUILDING 4102
4–STORY CONCRETE & BRICK
F.F. ELEV. = 7160.30

BORING 2

BORING 3

PROPOSED SOUTH ADDITION

BORING 4

BORING 1

PROPOSED RETAINING WALL

022–138	Kumar & Associates		LOCATION OF EXPLORATORY BORINGS	Fig. 1

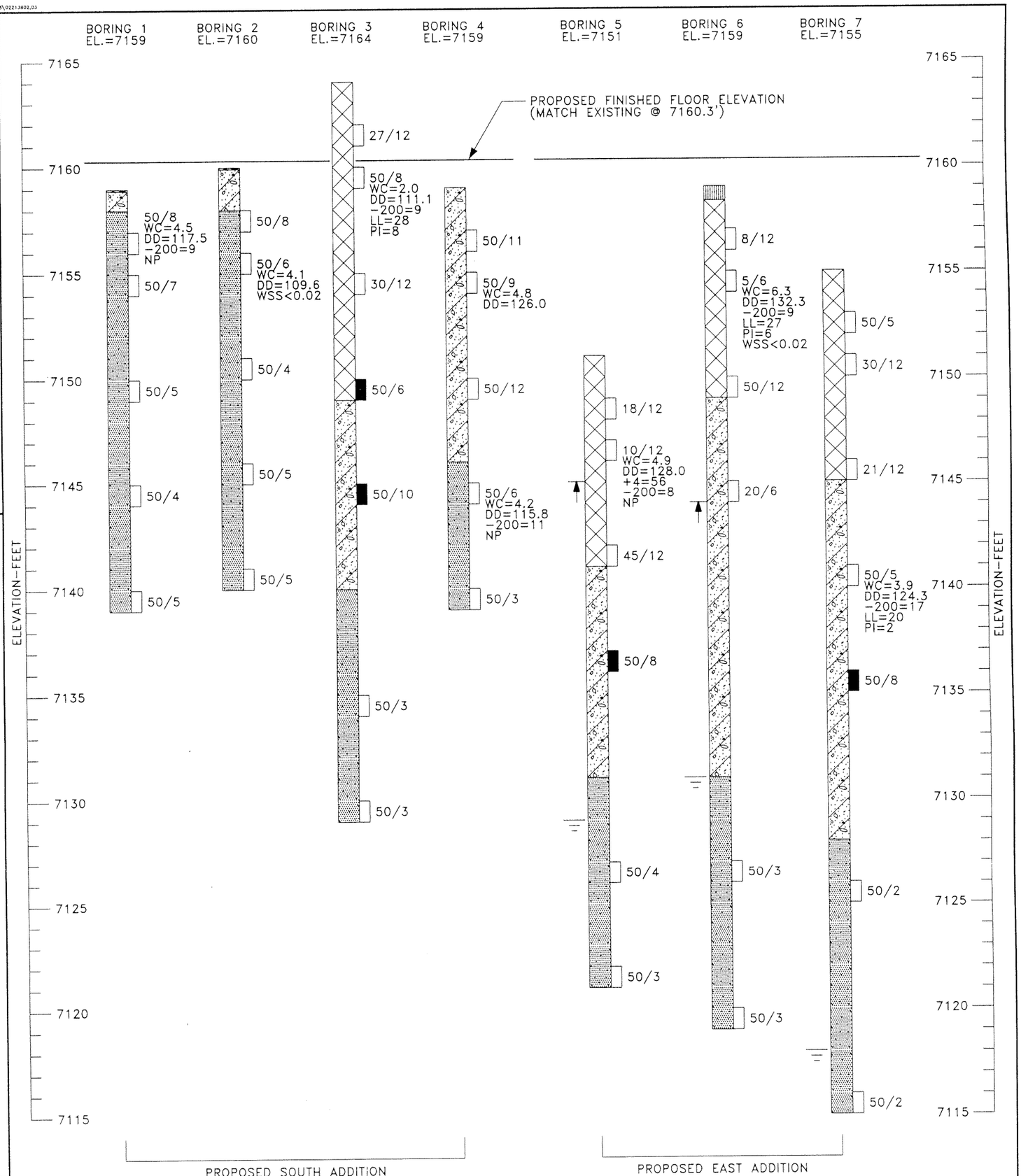
D:\2002\022-138\0221302.03

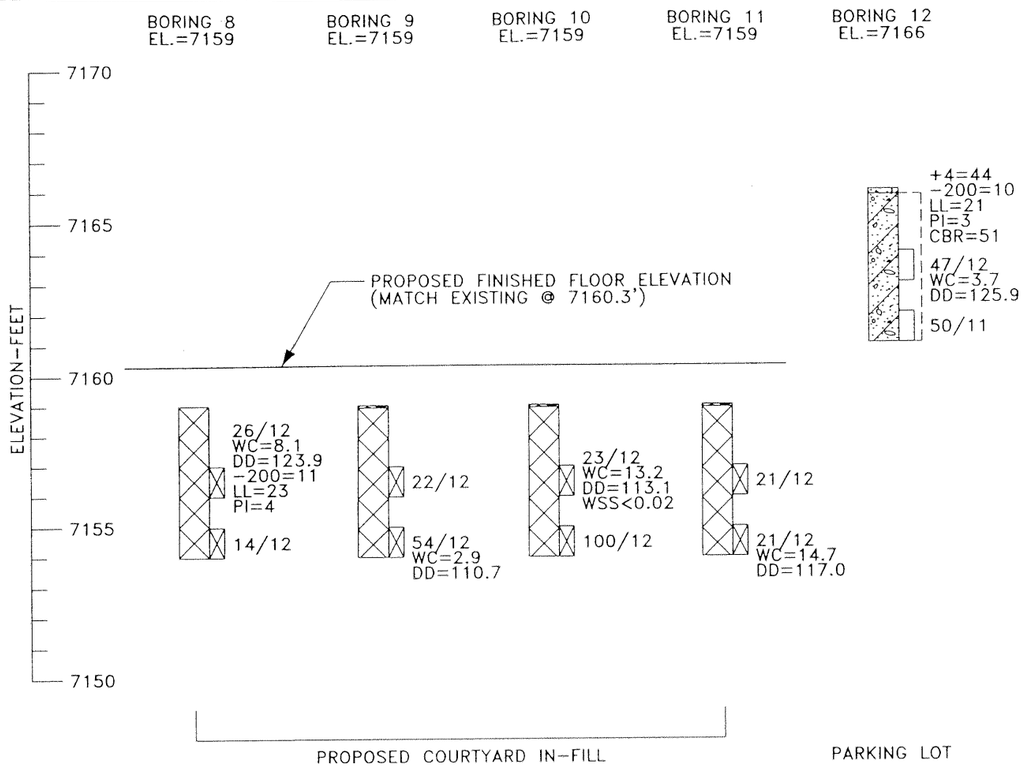
022-138

Kumar & Associates

LOGS OF EXPLORATORY BORINGS

Fig. 2





LEGEND

TOPSOIL.

LANDSCAPE GRAVEL.

CONCRETE.

FILL: SANDY GRAVEL TO GRAVELLY SAND, OCCASIONALLY SLIGHTLY SILTY TO CLAYEY, OCCASIONAL COBBLES, SLIGHTLY MOIST TO WET, DARK BROWN TO REDDISH BROWN.

SAND (SP-SM/SM), SLIGHTLY SILTY TO SILTY, GRAVELLY, AND GRAVEL (GM), SILTY, SANDY WITH OCCASIONAL COBBLES, MEDIUM DENSE TO VERY DENSE, SLIGHTLY MOIST TO VERY MOIST, BROWN TO REDDISH BROWN.

SANDSTONE BEDROCK, NONCEMENTED, VERY HARD, SLIGHTLY MOIST, LIGHT BROWN.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLER, DRIVEN BY A 140-POUND HAMMER.

DRIVE SAMPLE, 1 3/8-INCH I.D. SPLIT SPOON SAMPLER, DRIVEN BY A 140-POUND HAMMER.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLER, DRIVEN BY A 40-POUND HAMMER.

50/8 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 50 BLOWS OF THE DRIVE HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 8 INCHES.

DEPTH TO WATER LEVEL AT THE TIME OF DRILLING.

PRACTICAL AUGER DRILLING REFUSAL.

LABORATORY TEST RESULTS:

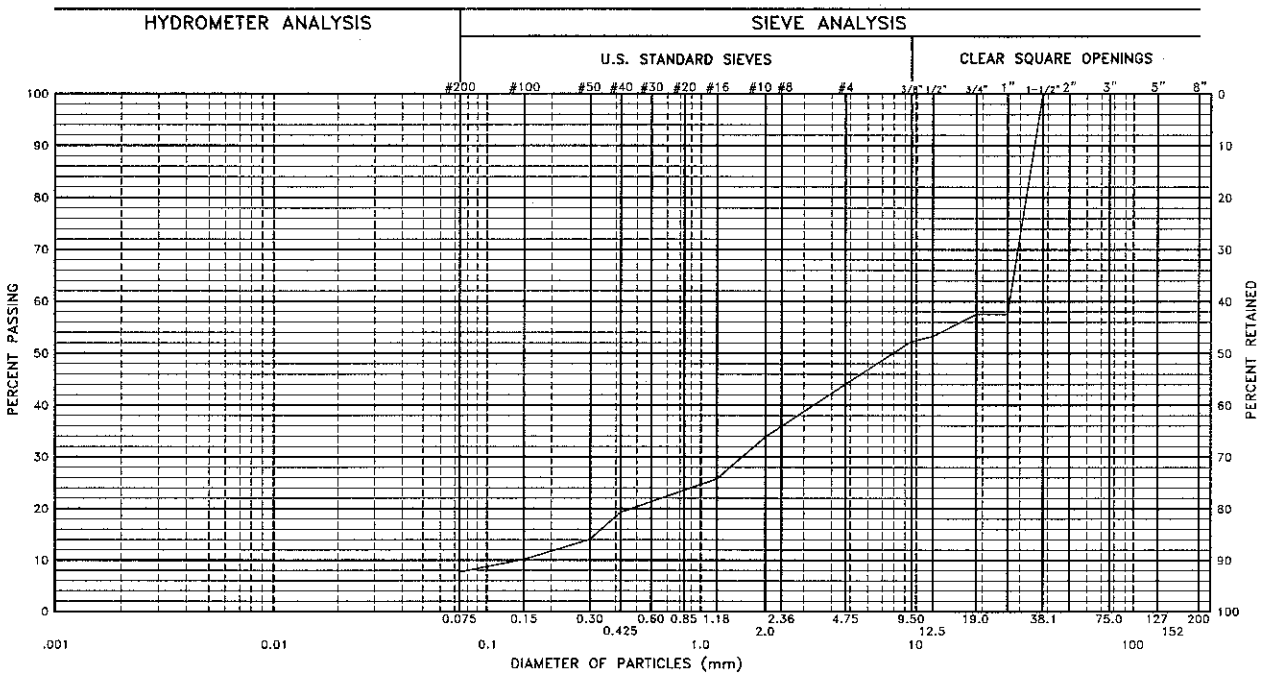
WC = NATURAL MOISTURE CONTENT (%);
DD = NATURAL DRY DENSITY (pcf);
+4 = PERCENTAGE RETAINED ON NO. 4 SIEVE;
-200 = PERCENTAGE PASSING NO. 200 SIEVE;
LL = LIQUID LIMIT;
PI = PLASTICITY INDEX;
NP = NONPLASTIC;
WSS = WATER SOLUBLE SULFATES (%);
CBR = CALIFORNIA BEARING RATIO (%).

NOTES

1. EXPLORATORY BORINGS 1 THROUGH 7 AND BORING 12 WERE DRILLED ON APRIL 22, 2002 AND MAY 28, 2002. BORINGS 1 THROUGH 7 WERE DRILLED WITH A 4-INCH DIAMETER CONTINOUS FLIGHT POWER AUGER, AND BORING 12 WAS DRILLED WITH A 6-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER. BORINGS 8 THROUGH 11 WERE DRILLED ON APRIL 19, 2002, WITH A 4-INCH DIAMETER HAND AUGER.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED APPROXIMATELY BY TAPING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE OBTAINED BY INTERPOLATION BETWEEN CONTOURS ON THE PLAN PROVIDED.
4. THE EXPLORATORY BORINGS LOCATIONS AND ELEVATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUND WATER LEVELS SHOWN ON THE LOGS WERE MEASURED AT THE TIME OF DRILLING. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.

D:\2002\022-138\022138f2.ai

022-138	Kumar & Associates		LOGS OF EXPLORATORY BORINGS	Fig. 3

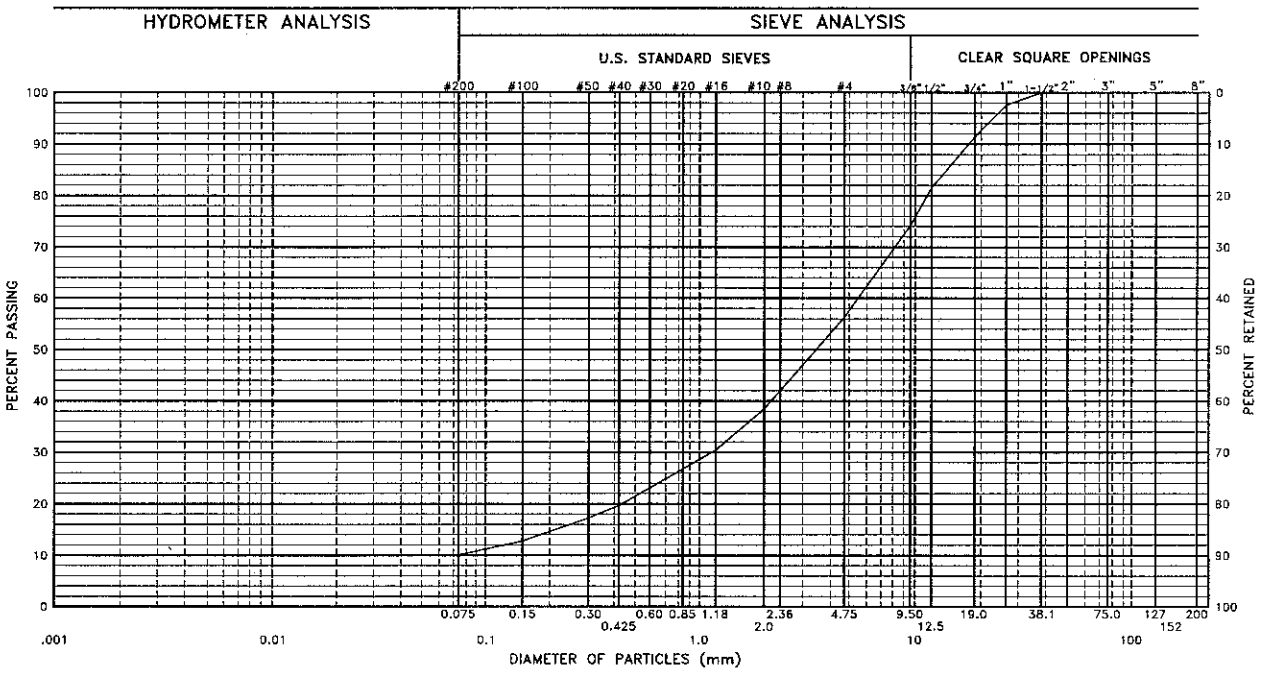


SILT AND CLAY	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

GRAVEL: 56 %
SAND: 36 %
SILT AND CLAY: 8 %

LIQUID LIMIT:
PLASTICITY INDEX: NP

SAMPLE OF: Fill: Slightly silty, sandy gravel
FROM: Boring 5 @ 4 feet



SILT AND CLAY	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

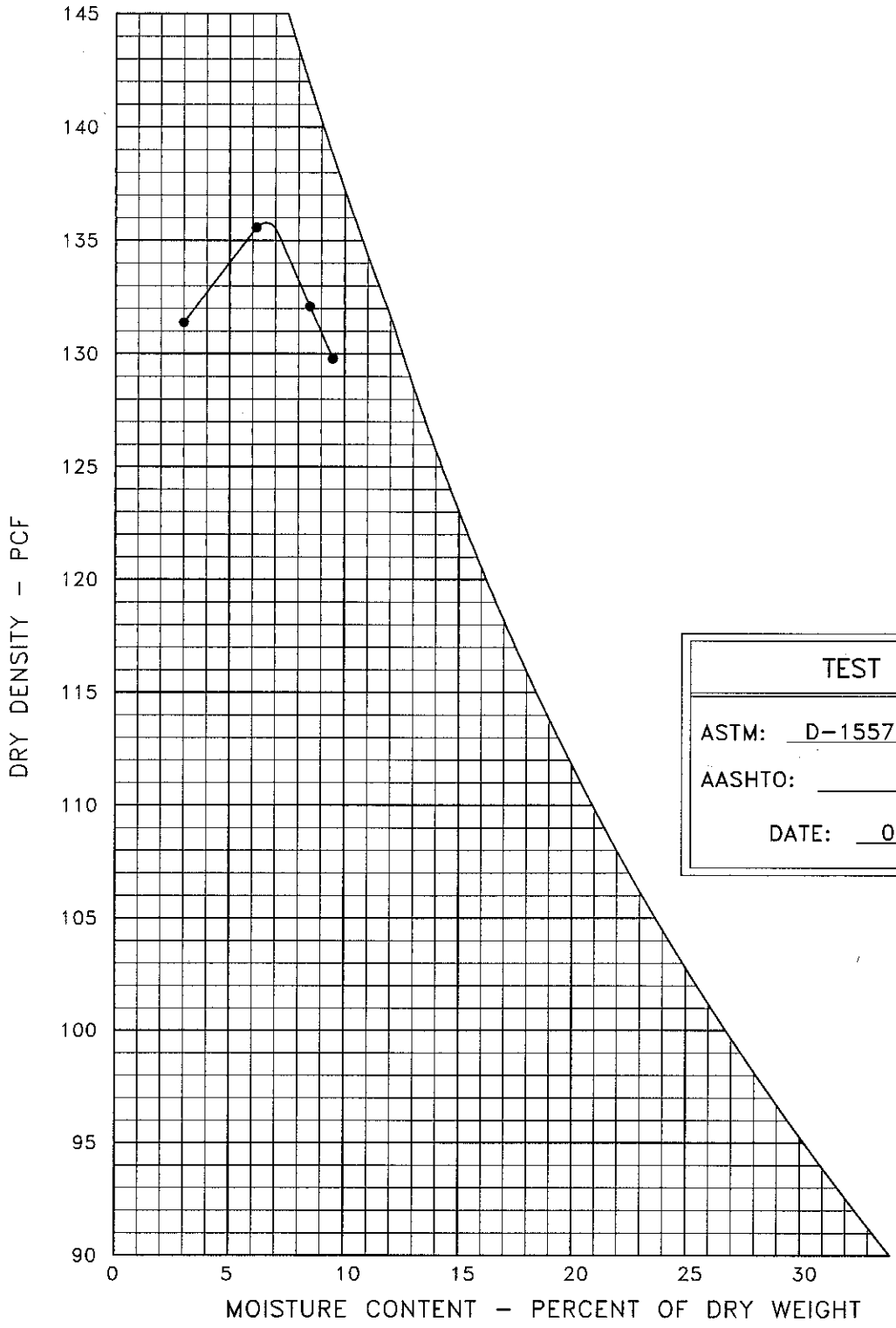
GRAVEL: 44 %
SAND: 46 %
SILT AND CLAY: 10 %

LIQUID LIMIT: 21
PLASTICITY INDEX: 3

SAMPLE OF: Slightly silty, very gravelly sand
FROM: Boring 12 @ 0.2–5 feet

D:\2002\022-138\0213804

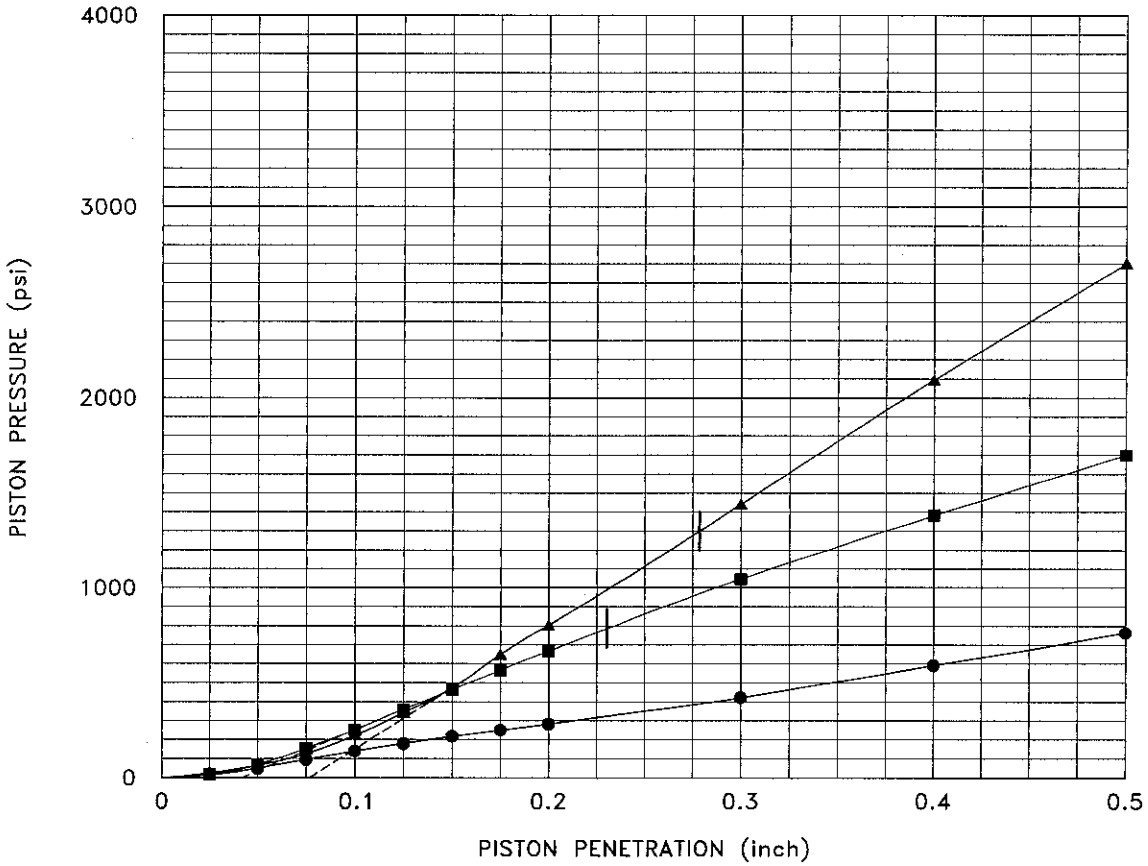
022–138	Kumar & Associates	GRADATION TEST RESULTS	Fig. 4



TEST METHOD
ASTM: D-1557-91 Method C
AASHTO:
DATE: 05/01/02

MAXIMUM DRY DENSITY: 136.0 pcf	OPTIMUM MOISTURE CONTENT: 6.5 %	
SOIL TYPE: Slightly silty, very gravelly sand	GRAVEL: 44 % SAND: 46 % SILT AND CLAY (-200): 10 %	LIQUID LIMIT: 21 PLASTICITY INDEX: 3
LOCATION: USAFA Hospital, on-site material	BORING NO.: 12	DEPTH: 0.2-5'

022-138	Kumar & Associates	MOISTURE-DENSITY RELATIONSHIP	Fig. 5



	SURCHARGE PRESSURE (psf): 10					
	TEST NO.	AS-MOLDED DRY DENSITY (pcf)	AS-MOLDED PERCENT COMPACTION	AS-MOLDED MOISTURE (%)	MOISTURE AFTER SOAKING IN TOP INCH(%)	CONSOLIDATION OR SWELL (%)
●	1	122.1	89.8	6.8	7.8	-0.17
■	2	129.4	95.2	6.6	7.6	-0.09
▲	3	136.6	100.4	6.1	6.4	-0.31

PISTON PRESSURE-PENETRATION DATA

	TEST NO.	PRESSURE (psi)	PENETRATION (INCH)											CBR (%)
			.025	.050	.075	.100	.125	.150	.175	.200	.300	.400	.500	
●	1		16	50	95	141	179	218	251	283	422	592	763	18.9
■	2		18	68	154	251	359	464	569	669	1047	1383	1700	52.5*
▲	3		25	63	127	227	341	473	651	804	1442	2094	2702	86.7*

*CORRECTED CBR

SAMPLE DESCRIPTION

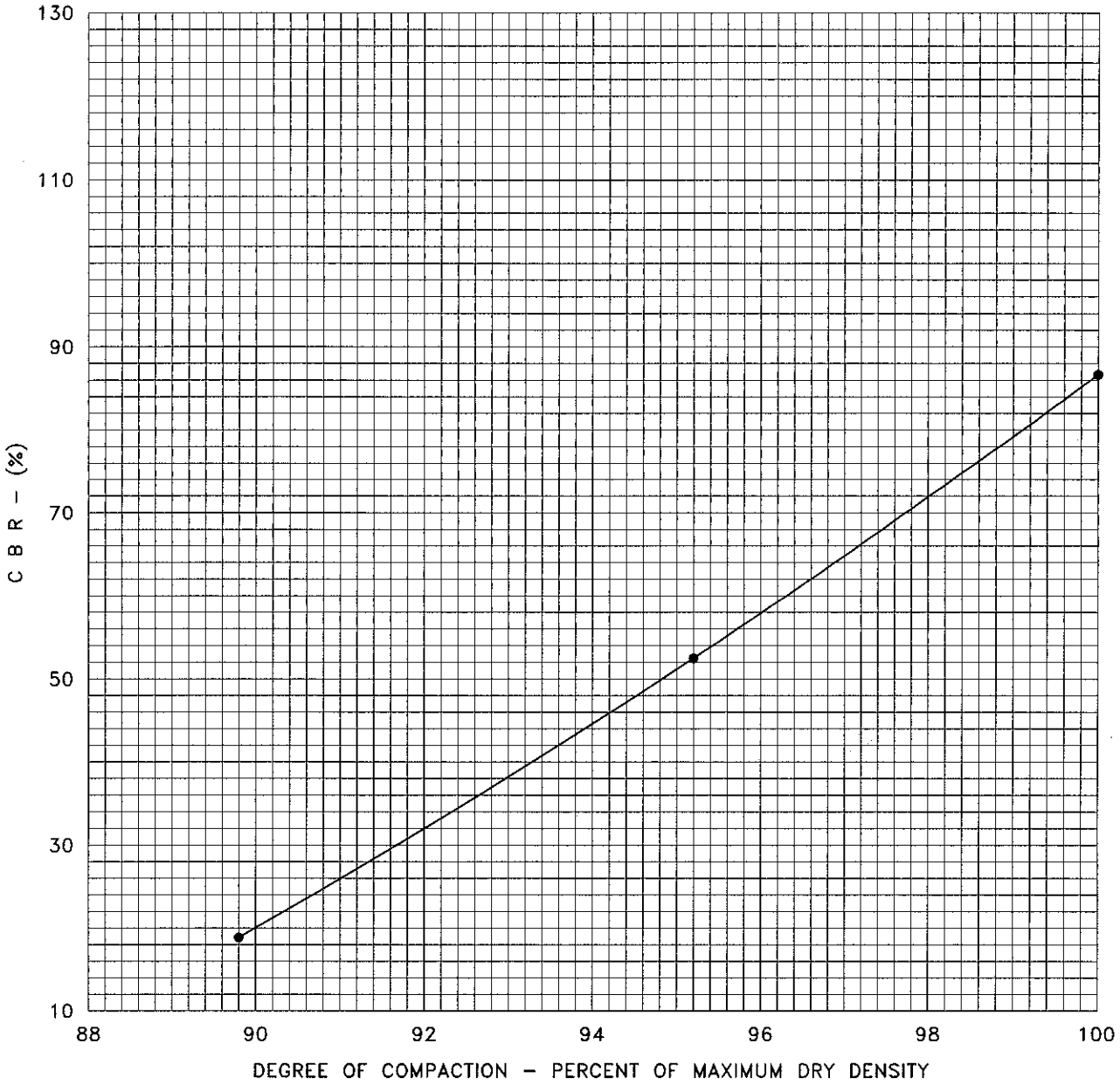
BORING NO.: 12 DEPTH: 0.2-5'

PERCENT PASSING NO. 200 SIEVE: 10 LIQUID LIMIT: 21 PLASTICITY INDEX: 3

MAXIMUM DRY DENSITY: 136.0 pcf OPTIMUM MOISTURE CONTENT: 6.5 %

SOIL DESCRIPTION: Slightly silty, very gravelly sand

022-138	Kumar & Associates	CALIFORNIA BEARING RATIO	Fig. 6



CURVE NO.	SAMPLE IDENTIFICATION	SOIL TYPE	UNIFIED SOIL CLASSIFICATION	C B R @ 90 (%) COMPACTION	C B R @ 95 (%) COMPACTION
1	Boring 12 @ 0.2-5'	Slightly silty, very gravelly sand	SP-SM	20	51

022-138	Kumar & Associates	CALIFORNIA BEARING RATIO	Fig. 7

Kumar & Associates, Inc.

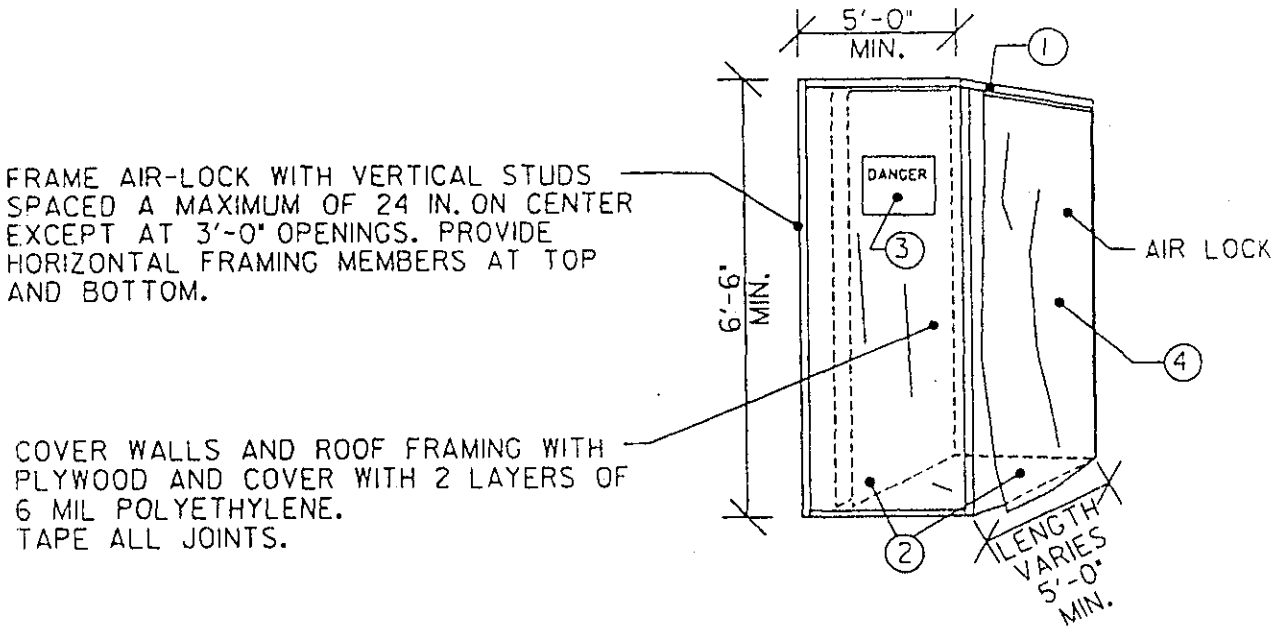
TABLE I

SUMMARY OF LABORATORY TEST RESULTS

Project No. 022-138

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	CBR	AASHTO CLASSIFICATION (GROUP INDEX)	SOIL OR BEDROCK DESCRIPTION
BORING	DEPTH (ft)			GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX				
1	2	4.5	117.5			9		NP				Sandstone
2	4	4.1	109.6						<0.02			Sandstone
3	4	2.0	111.1			9	28	8				Fill: slightly clayey, gravelly sand
4	4	4.8	126.0									Slightly silty, gravelly sand
	14	4.2	115.8			11		NP				Sandstone
5	4	4.9	128.0	56	36	8		NP			A-1-a (0)	Fill: slightly silty, sandy gravel
6	4	6.3	132.3			9	27	6	<0.02			Fill: slightly silty, gravelly sand
7	14	3.9	124.3			17	20	2				Silty, gravelly sand
8	2	8.1	123.9			11	23	4				Fill: slightly silty, gravelly sand
9	4	2.9	110.7									Fill: slightly silty, gravelly sand
10	2	13.2	113.1						<0.02			Fill: slightly silty, gravelly sand
11	4	14.7	117.0									Fill: slightly silty, gravelly sand
12	0.2-5			44	46	10	21	3		51	A-1-a (0)	Slightly silty, very gravelly sand
	2	3.7	125.9									Slightly silty, very gravelly sand

Part 2, Setup Details



Air lock

1. Establish work area so that unauthorized entry is prevented; see sheet 11. Construct a wood frame. Install one layer of 6-mil polyethylene sheeting to structural members and two layers to the floor. Seal all edges of sheeting to wall, ceiling, and floor surfaces with duct tape.

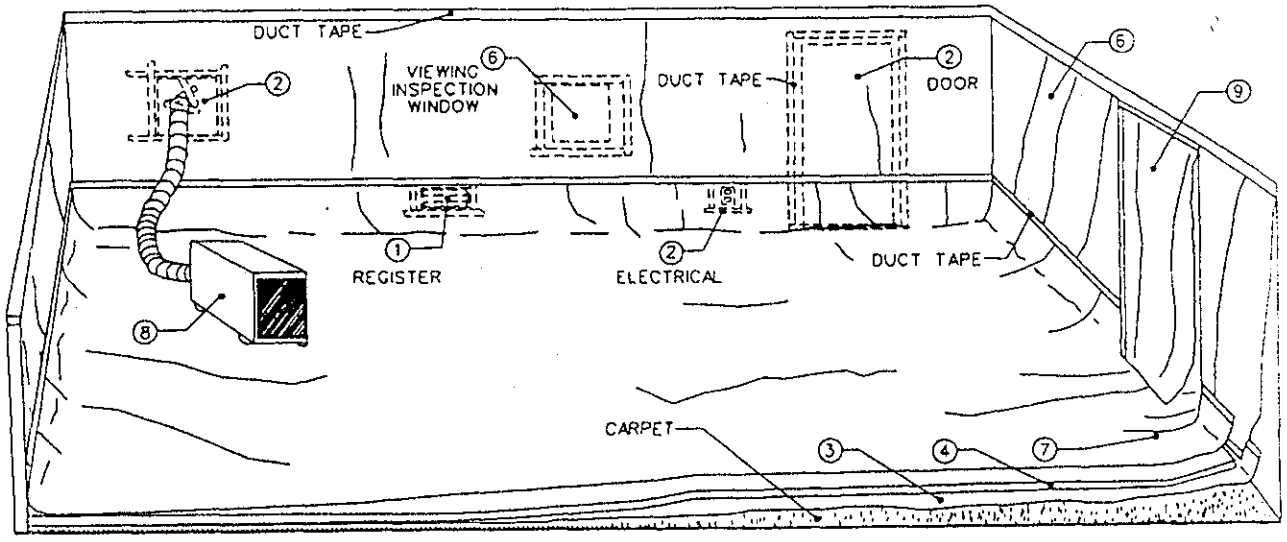
2. Install triple flaps of 6-mil polyethylene sheeting at both doorways.

3. Install danger signs on each side of air lock area; see sheet 11.

4. Before leaving work area, remove outer suit. Place in a plastic bag; see sheet 9.

5. Enter air lock. Wet wipe respirator and wash hands with clean water from portable sprayer. Remove respirator, and place in a clean plastic bag. Proceed to shower, where inner suit may be removed.

Final clearance requirements. After abatement is completed, prepare area for final clearance. Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection.* Contract designee(s) will conduct final air-clearance monitoring as required by the contract. Remove containment area upon instructions from the Contracting Officer, and treat as asbestos-contaminated material; see sheets 9 and 14.



Installation of critical barrier and full containment area (for carpeted floors)

1. Establish work area so that unauthorized entry is prevented; see sheet 11. Eliminate airflow into containment area by isolating all supply and return air ducts from mechanical system. Lock doors and windows not required for access.

2. Install 6-mil polyethylene critical barriers over all windows, doors, wall openings, electrical outlets, etc. Secure with duct tape on all sides. HEPA vacuum furniture, fixtures, and equipment and remove from or protect in containment area, as specified by the contract.

3. Install first layer of 6-mil polyethylene on floor, extending the polyethylene 18 inches up wall. Secure with duct tape.

4. Install 0.5-inch plywood in order to protect 6-mil polyethylene underlay.

5. Prepare area as follows: turn off electrical power and remove light fixtures. Protect ceiling as required. HEPA vacuum plywood and walls.

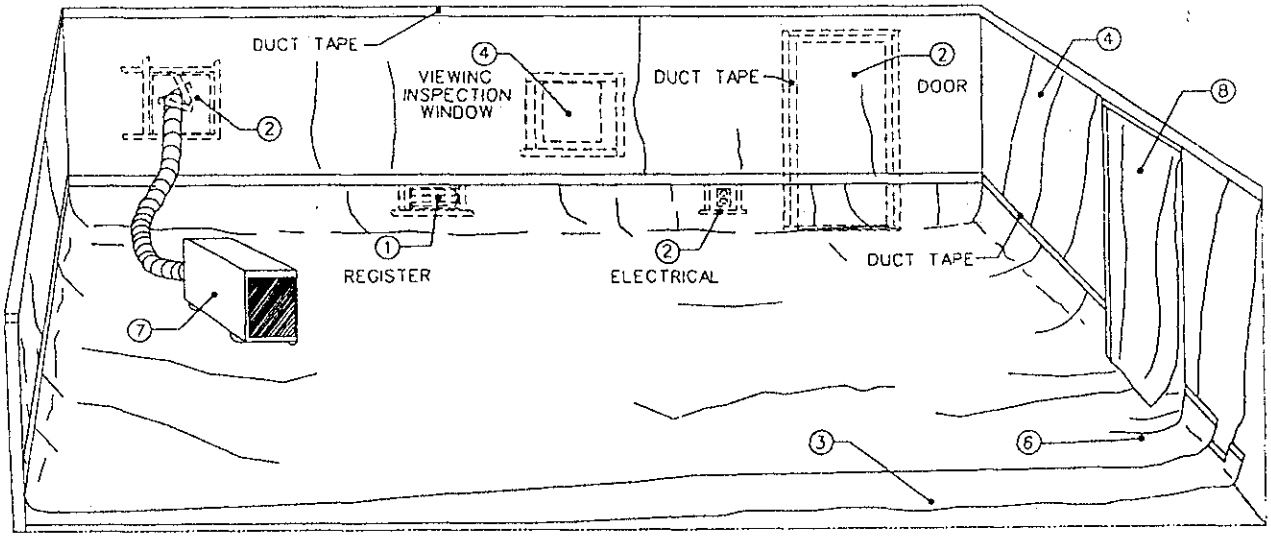
6. Protect wall surface with 6-mil polyethylene from floor to ceiling where walls are not to be abated. Install viewing inspection windows, where feasible.

7. Place 6-mil polyethylene on top of plywood, extending polyethylene 18 inches up wall.

8. Install HEPA filter unit and duct work; see sheet 6.

9. Prepare door into decontamination or load-out unit. See sheet 22 for decontamination unit and sheet 20 for load-out unit. Doors that swing into the work area must be removed from hinges.

Final clearance requirements. After abatement has been completed, see sheet 16 for final clearance requirements.



Installation of critical barrier and full containment area (for hard floor surfaces)

1. Establish work area so that unauthorized entry is prevented; see sheet 11. Eliminate airflow into containment area by isolation of all supply and return air ducts from mechanical system. Lock doors and windows not required for access.

2. Install 6-mil polyethylene critical barriers over all windows, doors, wall openings, electrical outlets, etc. Secure with duct tape on all sides. HEPA vacuum furniture, fixtures, and equipment and remove from or protect in containment area, as specified by the contract.

3. Install first layer of 6-mil polyethylene on floor, extending the polyethylene 18 inches up wall. Secure with duct tape.

4. Protect wall surface with 6-mil polyethylene from floor to ceiling. Install view inspection windows, where feasible.

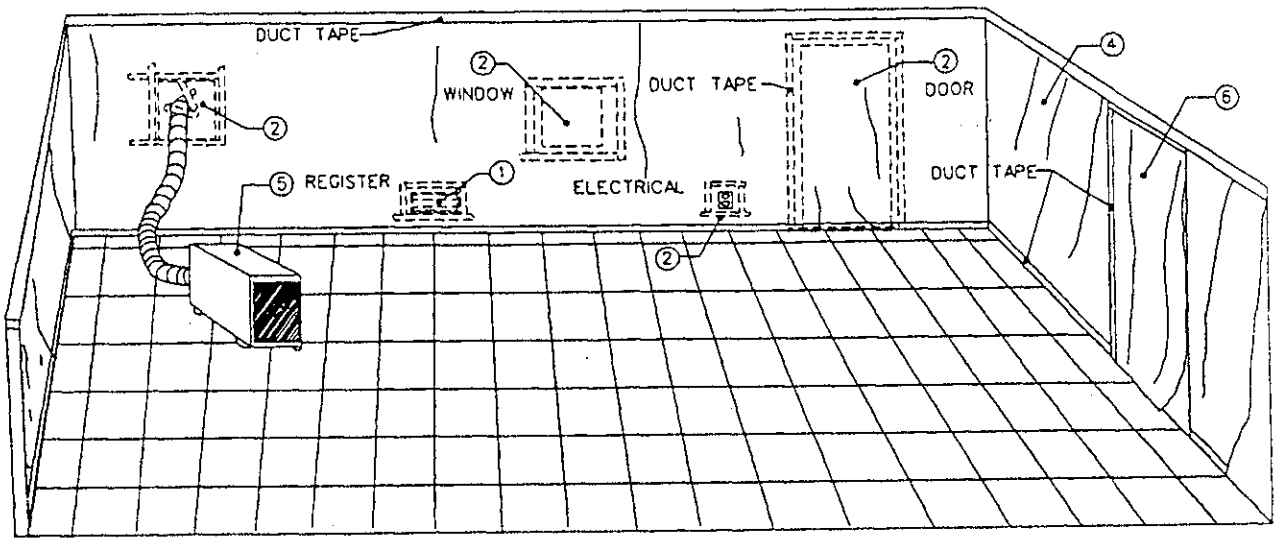
5. Prepare area as follows: turn off electrical power and remove light fixtures. Protect ceiling as required. HEPA vacuum floor and walls.

6. Install top layer of 6-mil polyethylene.

7. Install HEPA filter unit and duct work; see sheet 8.

8. Prepare door into decontamination unit or load-out unit; see sheet 22 for decontamination unit and sheet 20 for load-out unit. Doors that swing into the work area must be removed from hinges.

Final clearance requirements. After abatement has been completed, see sheet 17 for final clearance requirements.



Installation of critical barrier and full containment area (for vinyl tile floors)

1. Establish work area so that unauthorized entry is prevented; see sheet 11. Eliminate airflow into containment area by isolating all supply and return air ducts from mechanical system. Lock doors and windows not required for access.

2. Install 6-mil polyethylene critical barriers over all windows, doors, wall openings, electrical outlets, etc. Secure with duct tape on all sides. HEPA vacuum furniture, fixtures, and equipment and remove from or protect in containment area, as specified by the contract.

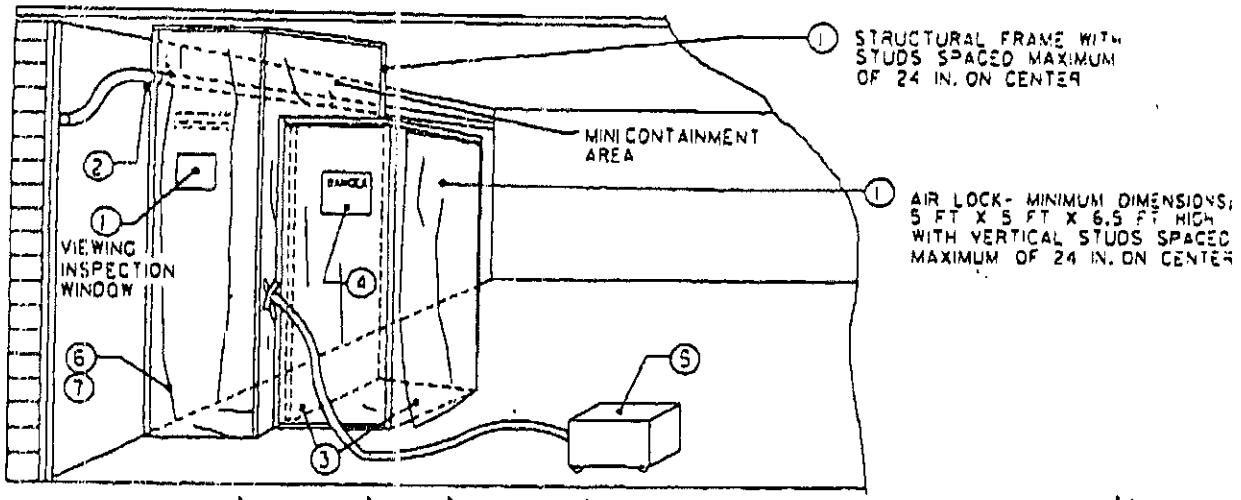
3. Prepare area as follows: turn off electrical power and remove light fixtures. Protect ceiling as required. HEPA vacuum floors and walls.

4. Protect wall surface with 6-mil polyethylene from floor to ceiling. Install viewing inspection windows, where feasible.

5. Install HEPA filter unit and duct work; see sheet 8.

6. Prepare door into decontamination unit or load-out unit; see sheet 22 for decontamination unit and sheet 20 for load-out unit. Doors that swing into the work area must be removed from hinges.

Final clearance requirements. After abatement has been completed, see sheet 18 for final clearance requirements.



* Mini containments shall not be used for ACM drywall or contaminated wall cavity openings unless written Variance is granted by Colorado DPHE. Otherwise use full containment method.

* Mini-containment area

1. Establish work area so that unauthorized entry is prevented; see sheet 11. Construct a two-compartment wood frame around work area; install one layer 6-mil polyethylene sheeting to structural members and two layers 6-mil polyethylene sheeting to the floor. Seal all edges to wall, ceiling, and floor surfaces with duct tape. Install viewing inspection windows, where feasible.

2. Seal with duct tape all penetrations (typical) such as pipes, electrical conduit, or ducts.

3. Install triple 6-mil polyethylene flaps at both doorways. Place portable sprayer with clean water, disposable towels, and prelabeled disposal bag in air lock.

4. Install danger signs on outside of containment area. See sheet 11.

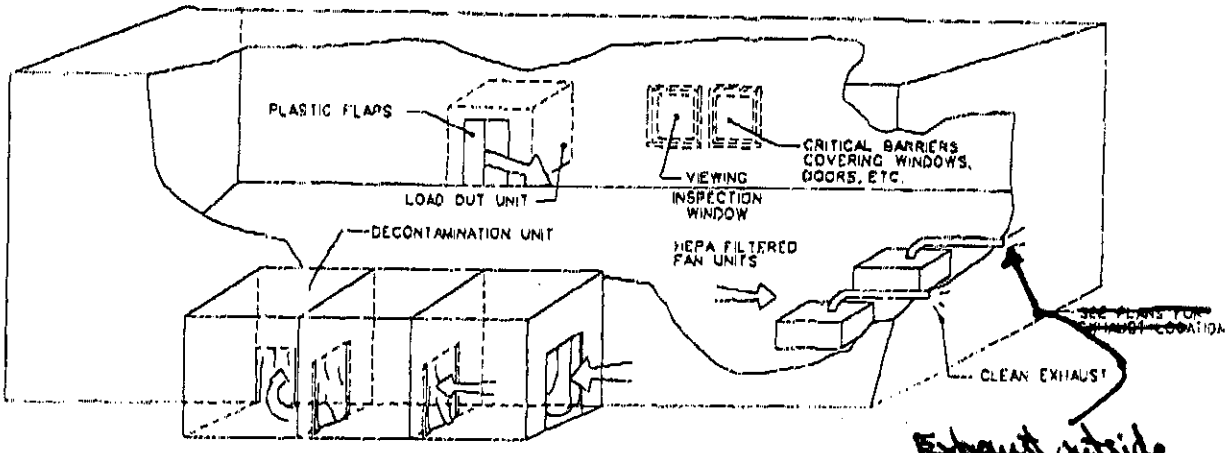
5. Install HEPA vacuum; extend hose into mini-containment area for general vacuuming, negative air, and cleaning of disposible suit.

6. Accumulate all loose materials for disposal. Place in approved container; see sheet 9. Apply labels; see sheet 14. Adequately wet clean all wall, floor, tool, and equipment surfaces.

7. Abatement worker must wear two disposable suits. Remove outer suit in work area and place in a plastic bag; see sheet 9. Enter air lock.

8. In air lock, wet wipe respirator and wash hands with clean water. Remove respirator and place in a clean plastic bag. Proceed to remote shower unit where inner suit may be removed.

Final clearance requirements. After abatement is completed, prepare area for final clearance. Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection*. Contractor will apply lockdown encapsulant. Contract designee(s) will conduct final air-clearance monitoring as required by the contract. Remove containment area upon instructions from the Contracting Officer, and treat it as asbestos- contaminated material. Place in approved container; see sheet 9. Apply labels, see sheet 14. Dispose of as specified in the contract.



Exhaust outside bldg. to fullest extent feasible. Submit detailed exhaust lay out in pre work submittals (i.e. Asbestos Hazard Abatement Plan)

Ventilation of containment area and decontamination unit, using HEPA filters

1. Install a ventilation system in the containment area that draws the air supply through the decontamination and load-out units. See sheets 20 and 22.

2. Operate ventilation system 24 hours a day from start of abatement through final clearance.

3. Place at the decontamination unit entrance a pressure gauge that measures differential pressure between abatement and ambient areas. Gauge must be read hourly and logged or continuously recorded.

4. The ventilation system must create, as a minimum, a negative pressure of 0.02 inches of water inside the containment area (relative to the outside of the containment area) and must be sized for a minimum of four air changes per hour or more, as specified in the contractor's asbestos hazard abatement plan.

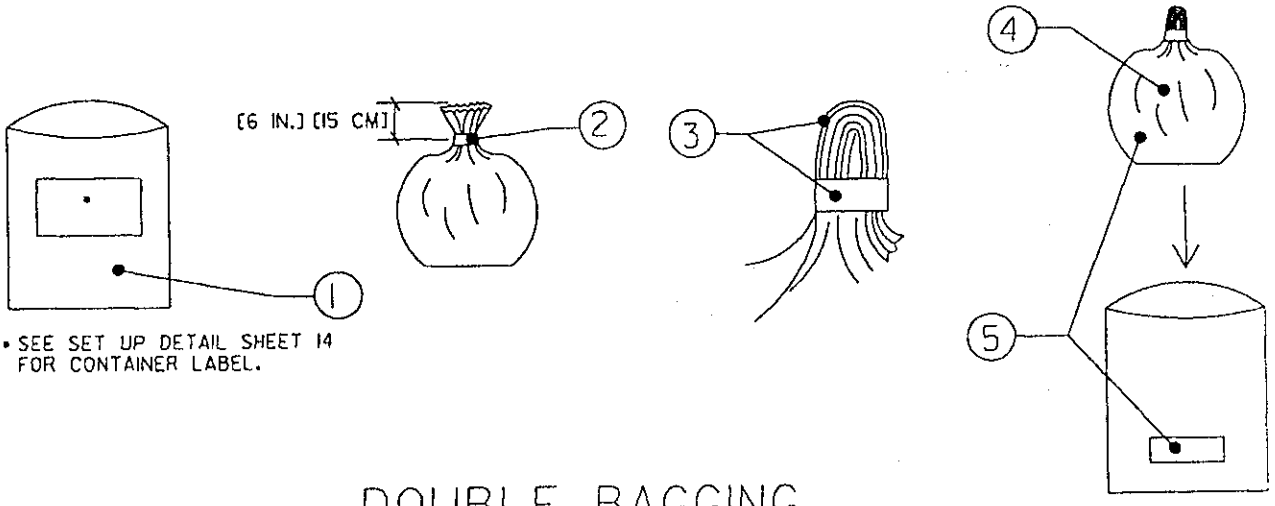
5. Locate HEPA filters in order to prevent dead air pockets. indicated in submittals

6. Exhaust filtered air to outside of building, unless otherwise approved by the Contracting Officer.

Final clearance requirements. For final clearance, remove ventilation system upon instruction from the Contracting Officer and relocate to equipment room of decontamination unit. Thoroughly HEPA vacuum unit and ducting. Adequately wet clean all surfaces and wheels of unit(s). Collect all waste debris and unit filters, and treat as asbestos-contaminated material, placing in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of waste as required by the contract. Wrap unit in one layer of 6-mil polyethylene sheeting, and seal with duct tape before removing from job location.

for Full containments and 0.01 for modified containments

Setup Detail
Sheet 8



DOUBLE BAGGING

Containers—double bagging

1. Place the still-wet asbestos-containing and asbestos-contaminated material into a prelabled 6-mil polyethylene bag. Do not overfill. Do not use bag for asbestos-containing or asbestos-contaminated material that could puncture the bag. (See sheet 9C for packaging items that could puncture bags.)

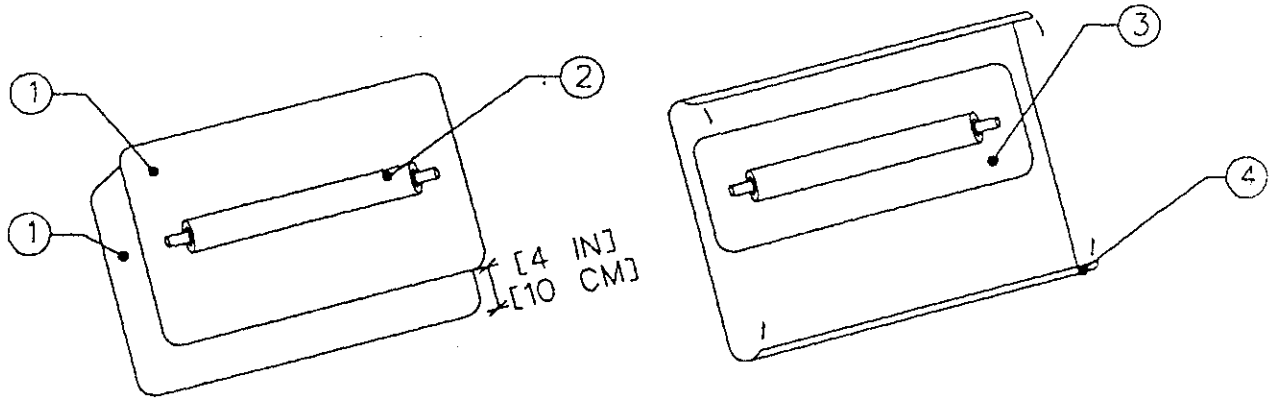
2. Evacuate with HEPA vacuum, and seal collapsed bag by twisting top [6 in] [15 cm] closed and wrapping with a minimum of two layers of duct tape.

3. Twist top and fold over. Apply second wrap of duct tape.

4. Adequately wet clean outside of disposal bag by wet wiping, and take bag to the equipment and staging area.

5. Place bag inside a second prelabled 6-mil polyethylene bag.

6. Seal outer bag by repeating steps 2 and 3 above. Take bag to load-out unit; see sheet 20.



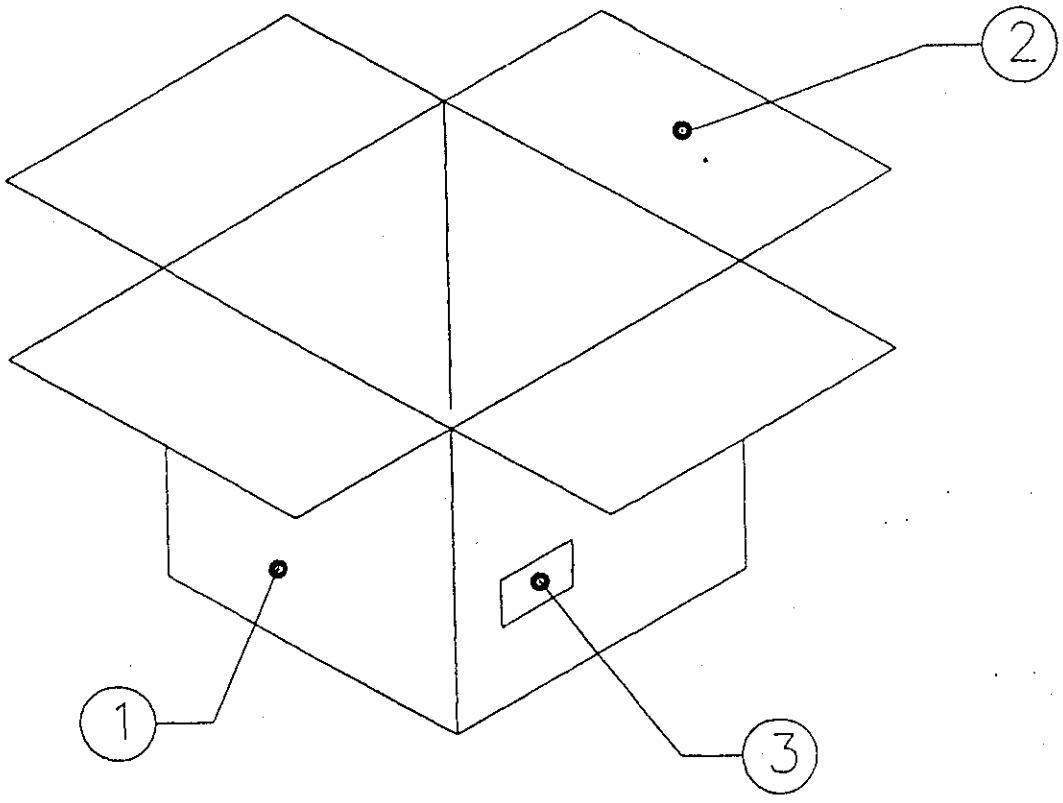
Containers—leak-tight wrapping

1. Place two layers of 6-mil polyethylene sheet on surface so that the bottom layer is offset [4 in] [10 cm] from the top layer.

2. Place the still-wet asbestos-containing or asbestos-contaminated material that is too large (boiler, vessel, pipe segment, etc.) to be placed in disposal bags on the top layer of polyethylene.

3. Wrap the top layer tightly around the contaminated material. Seal all edges of the top layer of sheeting with duct tape. Apply labels; see sheet 14.

4. Repeat procedure with bottom layer, including labeling. Take to load-out unit; see sheet 20.

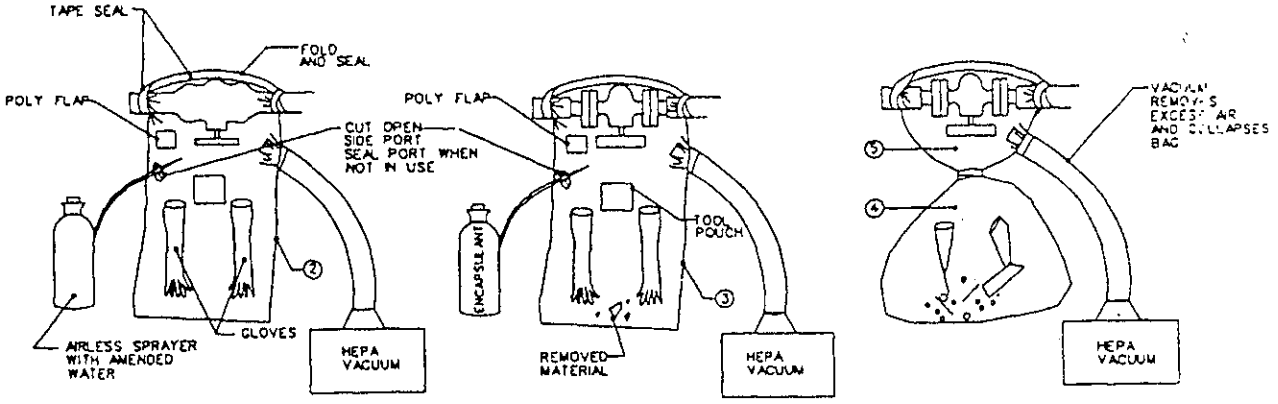


Containers—corrugated cardboard boxes

1. Place still-wet asbestos-containing or asbestos-contaminated material that could puncture disposal bags into heavy-duty corrugated cardboard boxes coated with plastic or wax that will retard deterioration from moisture.

2. Close flaps, and seal with duct tape.

3. Apply labels; see sheet 14. Place box into disposal bags; see sheet 9A. Take to load-out unit; see sheet 20.



Glove bag

1. Construct modified containment area in accordance with sheet 21. NOTE: Inspect for structural integrity the insulation material adjacent to section being removed, since glove bag removal procedure is not appropriate if it will cause asbestos fiber release from adjacent asbestos-containing material.

2. Put tools and rags inside glove bag. Insulation adjacent to the asbestos-containing material being removed must be adequately wet cleaned and sprayed with an encapsulant before placing glove bag over the area to be removed. Install glove bag according to manufacturer's instructions. (NOTE: Negative-air glove bags may be used if first approved by Contracting Officer. Manufacturer procedures for negative-air glove bags will vary from procedures identified on this sheet.) Install HEPA filter vacuum cleaner with hose ducted into bag. Seal with duct tape. Smoke test for leaks. Soak insulation with amended water.

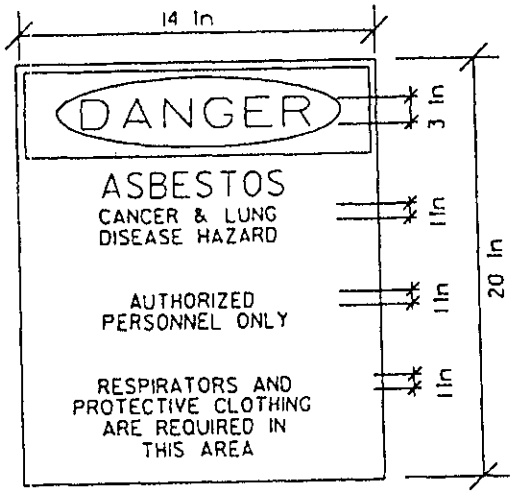
3. Remove insulation and clean exposed metal surfaces. Encapsulate exposed ends of insulation and metal surfaces. Adequately wet clean glove bag surfaces to below tool pouch.

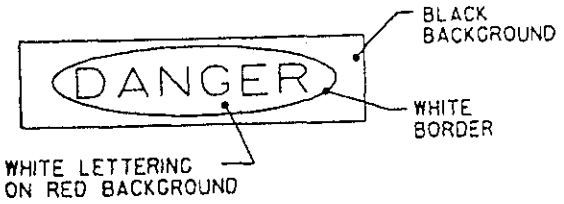
4. Grasp tools in pouch and withdraw by pulling glove inside out. Twist glove above encased tools to create a constriction, and tape constricted area with duct tape. Cut through middle of taped area so that tools and glove bag will both remain sealed. Place encased tools into tool pouch of next glove bag or decontaminate by water immersion.

5. Evacuate glove bag, using HEPA vacuum. Twist bag to create a constriction below tool pouch. Wrap constricted area with duct tape. Cut bag [4 in] [10 cm] above constriction. Double bag cut off portion of bag; see sheet 9. Apply labels; see sheet 14. Cap and seal end of HEPA vacuum hose in order to prevent incidental fiber release.

6. Remove remaining portion of glove bag. Place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose as asbestos-contaminated waste.

Final clearance requirements. For final clearance, Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection*. Contract designee(s) will conduct final air-clearance monitoring as required by the contract.





AREA WARNING SIGNS AND WARNING TAPE

DETAIL 01

Area warning signs and warning tape

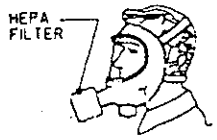
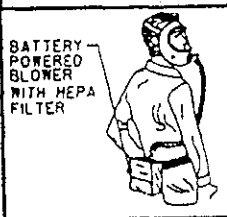
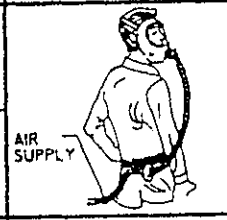
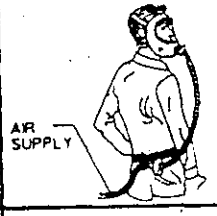
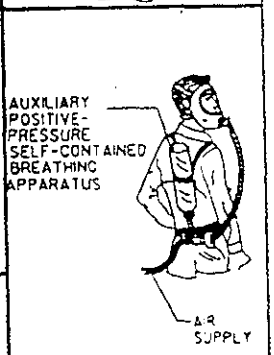
1. Provide and install [4 mil] [0.10 mm] polyethylene warning tape at locations shown on the abatement area plan.

2. Warning tape is to be attached to wood or metal posts at [10 ft] [300 cm] on center. Tape must be [3 ft] [100 cm] from ground.

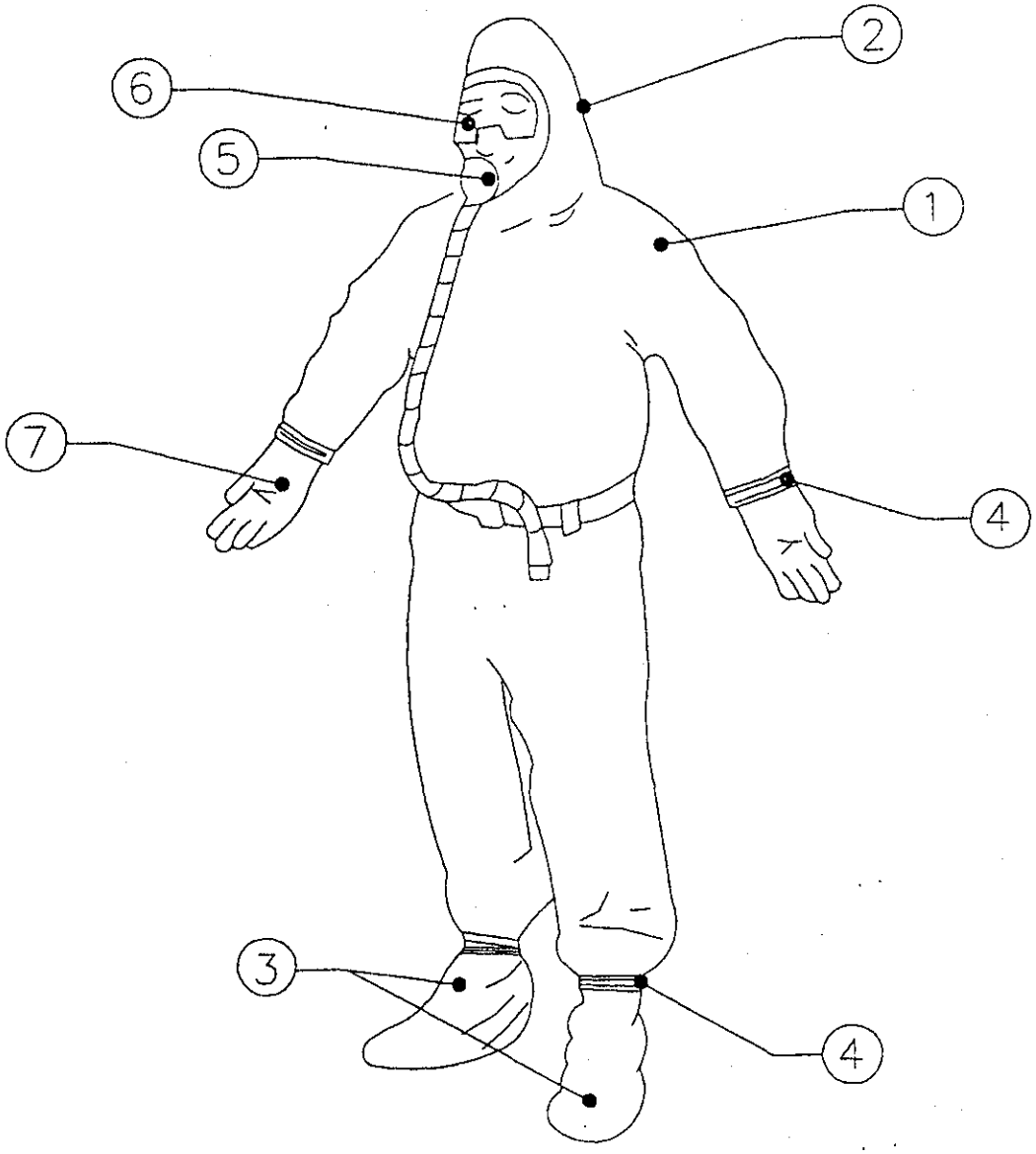
3. Attach both warning signs at each entrance of the work area and at [33 yd] [30 m] on center where security fencing is installed.

4. Warning signs must be in English and other languages required by the contract.

5. Install at eye level.

FIBER CONCENTRATION	MINIMUM REQUIRED RESPIRATOR	
NOT IN EXCESS OF 1 FIBER/CC	HALF-MASK AIR PURIFYING RESPIRATOR WITH HEPA FILTERS	
NOT IN EXCESS OF 5 FIBERS/CC	FULL FACEPIECE AIR-PURIFYING RESPIRATOR WITH HEPA FILTERS	
NOT IN EXCESS OF 10 FIBERS/CC	LOOSE FITTING HELMET OR HOOD, POWERED AIR-PURIFYING RESPIRATOR WITH HEPA FILTERS	
NOT IN EXCESS OF 10 FIBERS/CC	POWERED AIR-PURIFYING RESPIRATOR WITH FULL FACEPIECE AND HEPA FILTER	
NOT IN EXCESS OF 10 FIBERS/CC	LOOSE FITTING HELMET OR HOOD, SUPPLIED AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE WITH BACK-UP HEPA FILTER	
NOT IN EXCESS OF 10 FIBERS/CC	SUPPLIED AIR RESPIRATOR WITH FULL FACEPIECE OPERATED IN CONTINUOUS FLOW MODE WITH BACK-UP HEPA FILTER	
NOT IN EXCESS OF 100 FIBERS/CC	FULL FACEPIECE SUPPLIED AIR RESPIRATOR OPERATED IN PRESSURE-DEMAND MODE WITH BACK-UP HEPA FILTER	
GREATER THAN 100 FIBERS/CC OR UNKNOWN CONCENTRATION	FULL FACEPIECE SUPPLIED-AIR RESPIRATOR OPERATED IN PRESSURE-DEMAND MODE WITH AUXILIARY POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS	

Respiratory protection table



Protective clothing

1. Disposable or reusable full body suit with elastic around hood and shoe cover openings is required or as otherwise specified in the contract.

2. Hood shall be worn over respirator's head and neck straps.

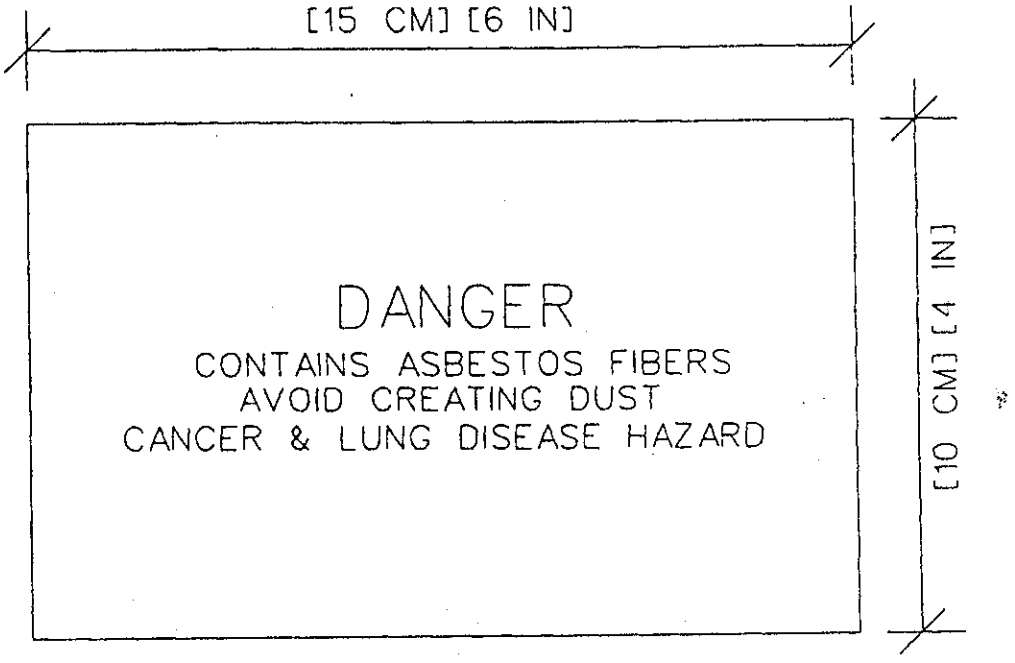
3. Shoe covers shall be worn over work shoes.

4. Cuffs shall be taped with duct tape at wrists and ankles in order to prevent infiltration.

5. Cartridge-type air-purifying HEPA filter respirator is minimal requirement. Type shall be selected in accordance with sheet 12.

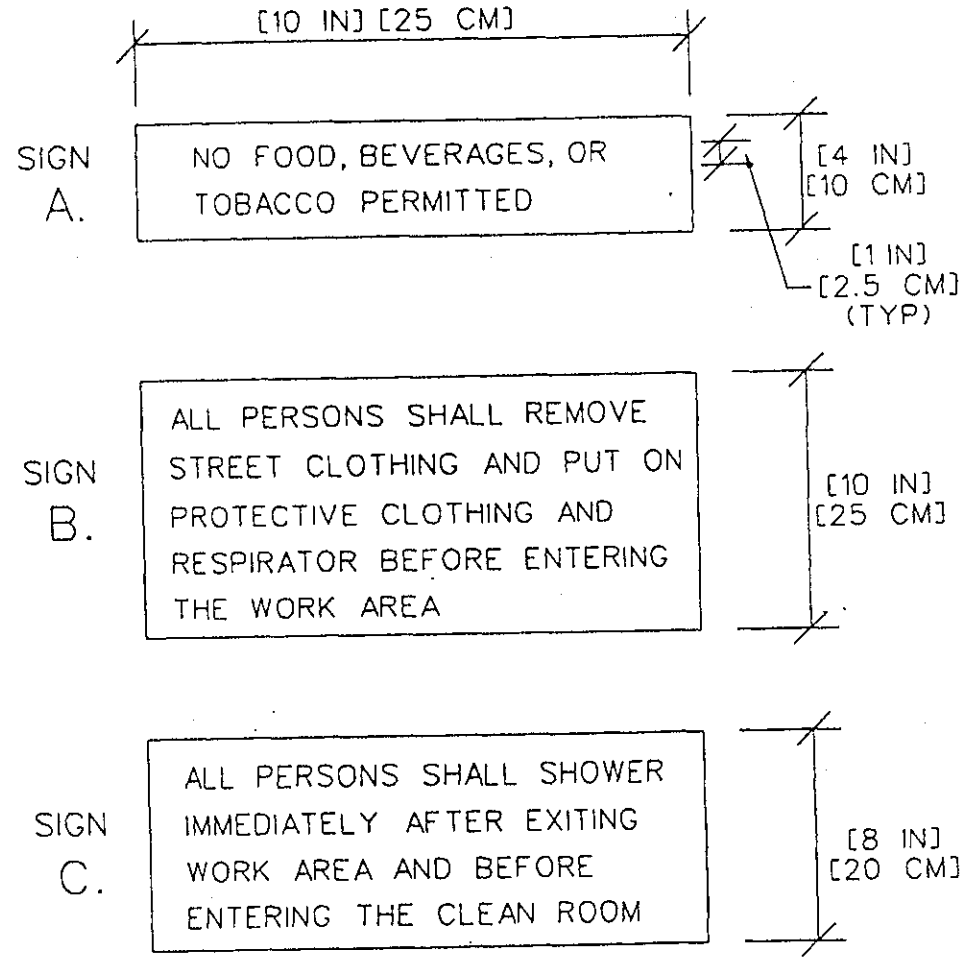
6. If eye protection is not integral with respirator, protection goggles are required.

7. Rubber work gloves are recommended to be worn alone or under outer work gloves provided for hand and operation safety.



Disposal container label

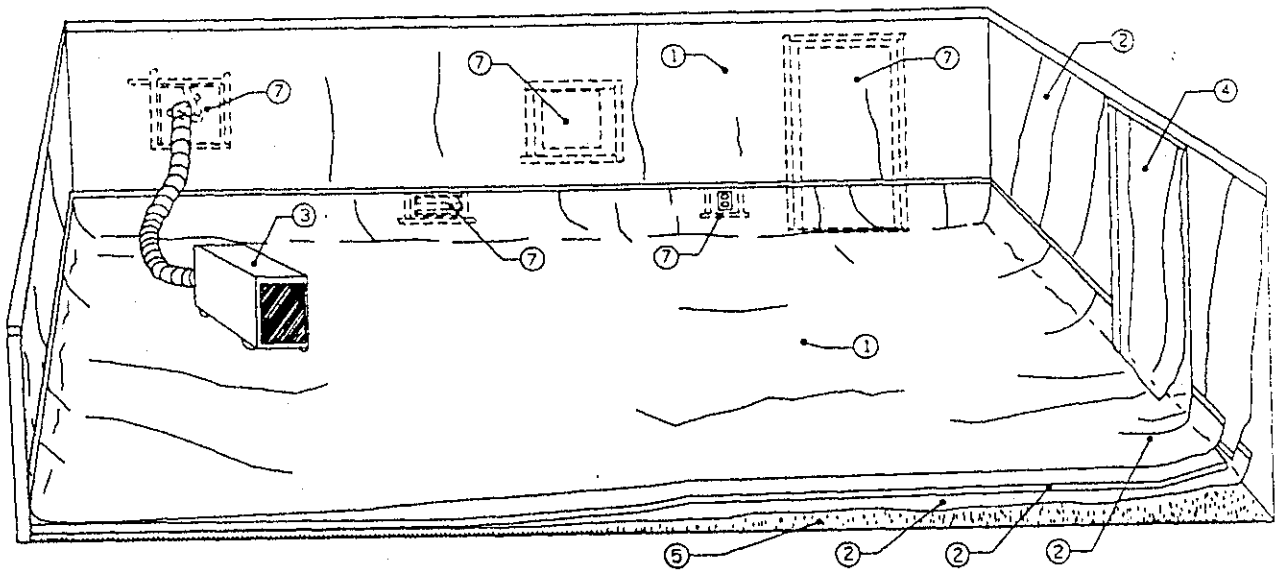
Attach warning labels to each disposal container removed from abatement area.



Decontamination unit signage

1. Provide signs in English and other languages required by the contract.

2. Install at eye level.



Preparation of full containment area for final clearance (for carpeted floors)

1. Accumulate all loose material for disposal. Place material in approved container; see sheet 9. Apply labels; see sheet 14. Adequately wet clean and HEPA vacuum all wall, floor, and equipment surfaces.

2. Contractor and contracting officer will certify visual inspection of work area on sheet 19, *Certification of Final Clearing and Visual Inspection*.

3. Apply lockdown encapsulant.

4. Remove polyethylene from walls, floor, and plywood. HEPA vacuum plywood before removal. Critical barriers sealing all windows, doors, wall openings, electrical outlets, etc., are to remain. Remove any temporary equipment enclosures used; see sheet 24. Treat polyethylene as asbestos-contaminated material. Place in approved container; see sheet 9 for leak-tight wrapping. Apply labels; see sheet 14. NOTE: With approval from the Contracting Officer, uncontaminated plywood can be treated as ordinary construction waste; otherwise, treat as asbestos-contaminated material.

5. HEPA filter unit remains in place and operating.

6. Door into contamination unit or load-out room remains.

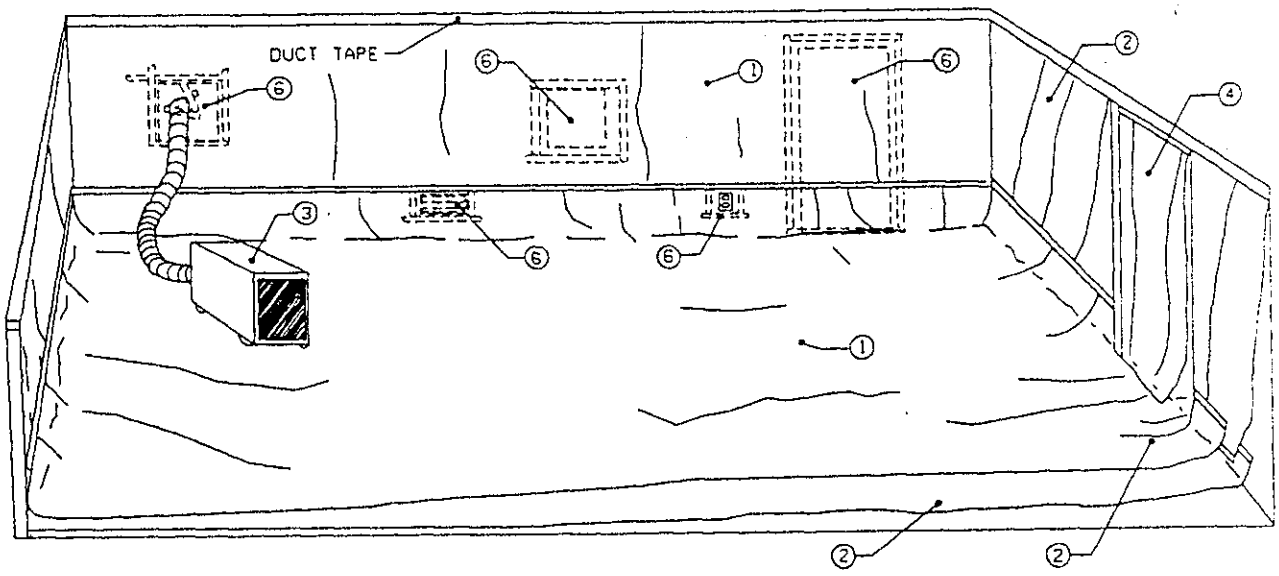
7. HEPA vacuum carpet.

8. Prepare area for final clearance.

9. Contractor and Contracting Officer will recertify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection*.

10. Contract designee(s) will conduct final air-clearance monitoring as required by the contract.

11. Upon instruction from Contracting Officer, shut down HEPA filter ventilation system, detach duct work, move system to equipment room of decontamination unit, clear and dispose of waste; see sheet 8. Remove critical barrier and place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of waste as asbestos-contaminated material.



Preparation of full containment area for final clearance (for hard-surfaced floors)

1. Accumulate all loose material for disposal. Place in approved container; see sheet 9. Apply labels; see sheet 14. Adequately wet clean and HEPA vacuum all wall, floor, and equipment surfaces.

2. Contractor and contracting officer will certify visual inspection of work area on sheet 19, *Certification of Final Clearing and Visual Inspection.*

3. Apply lockdown encapsulant.

4. Remove polyethylene on walls and floor. Critical barriers sealing all windows, doors, wall openings, electrical outlets, etc., are to remain. Remove any temporary equipment enclosures used; see sheet 24. Treat polyethylene as asbestos-contaminated material. Place in approved container; see sheet 9 for leak-tight wrapping. Apply labels; see sheet 14.

5. HEPA filter unit remains in place and operating.

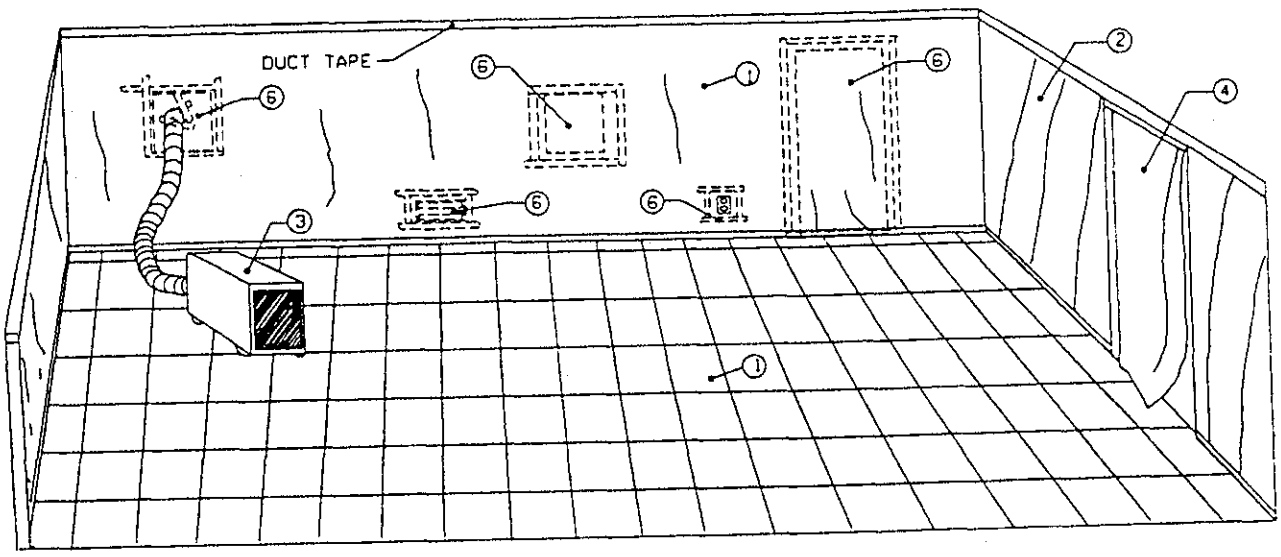
6. Door into decontamination unit or load-out room remains.

7. Prepare area for final clearance.

8. Contractor and Contracting Officer will recertify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection.*

9. Contract designee(s) will conduct final air-clearance monitoring as required by the contract.

10. Upon instruction from Contracting Officer, shut down HEPA filter ventilation system, detach duct work, move system to equipment room of decontamination unit, clear and dispose of waste; see sheet 8. Remove critical barrier and place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of waste as asbestos-contaminated material.



Preparation of containment area for final clearance (for vinyl tile floors)

1. Accumulate all loose material for disposal; see sheet 9. Apply labels; see sheet 14. Adequately wet clean all wall, floor, and equipment surfaces.

2. Contractor and contracting officer will certify visual inspection of work area on sheet 19, *Certification of Final Clearing and Visual Inspection.*

3. Apply lockdown encapsulant.

4. Remove polyethylene from walls. Critical barriers sealing all windows, doors, wall openings, electrical outlets, etc., are to remain. Remove any temporary equipment enclosures used; see sheet 24. Treat polyethylene as asbestos-contaminated material. Place in approved container; see sheet 9 for leak-tight wrapping. Apply labels; see sheet 14.

5. HEPA filter unit remains in place and operating.

6. Door into decontamination unit or load-out room remains.

7. Prepare area for final clearance.

8. Contractor and Contracting Officer will recertify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection.*

9. Contract designee(s) will conduct final air-clearance monitoring as required by the contract.

10. Upon instruction from Contracting Officer, shut down HEPA filter ventilation system, detach duct work, move system to equipment room of decontamination unit, clear and dispose of waste; see sheet 8. Remove critical barrier and place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of waste as asbestos-contaminated material.

Certification of Final Cleaning And Visual Inspection

Individual abatement task as identified in paragraph, Description of Work _____

In accordance with the cleaning and decontamination procedures specified in the Contractor's asbestos hazard abatement plan and this contract, the Contractor hereby certifies that he/she has thoroughly visually inspected the decontaminated regulated work area (all surfaces, including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) in accordance with ASTM E1368, *Standard Practice for Visual Inspection of Asbestos Abatement Projects*, and has found no dust, debris, or asbestos-containing material residue.

BY: (Contractor's signature) _____ Date _____

Print name and title _____

(Contractor's Onsite Supervisor signature) _____ Date _____

Print name and title _____

(Contractor's Industrial Hygienist signature) _____ Date _____

Print name and title _____

Contracting Officer Acceptance or Rejection

The Contracting Officer hereby determines that the Contractor has performed final cleaning and visual inspection of the decontaminated regulated work area (all surfaces including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and by quality assurance inspection, finds the Contractor's final cleaning to be:

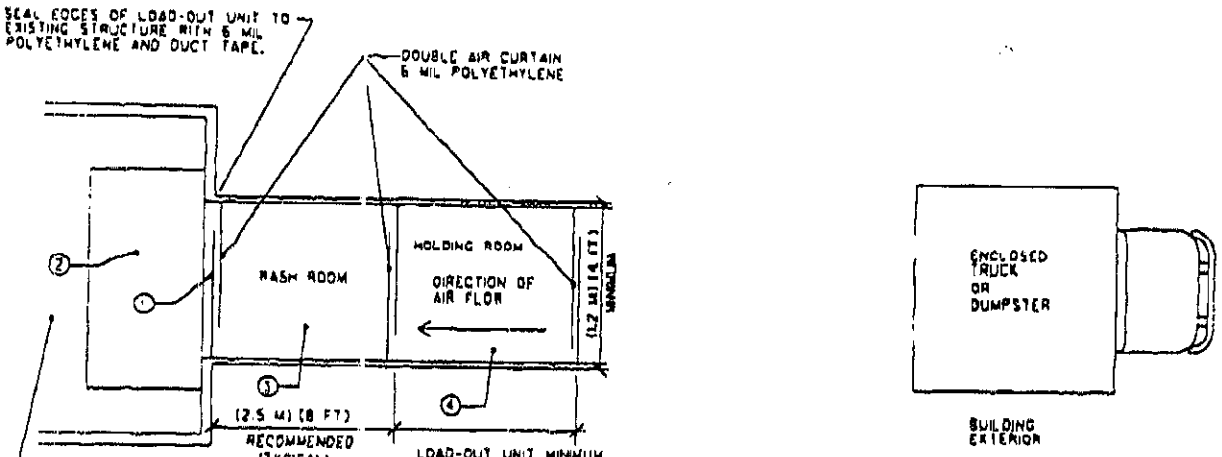
☐ Acceptable

☐ Unacceptable, Contractor instructed to reclean the regulated work area.

BY: Contracting Officer's Representative

Signature _____ Date _____

Print name and title _____



Load-out unit floor plan

1. Abatement worker is to enter and exit abatement work area only through decontamination unit.

2. Place additional 6-mil polyethylene sheeting on top of abatement area floor. Double bag asbestos-contaminated material in this area before removing.

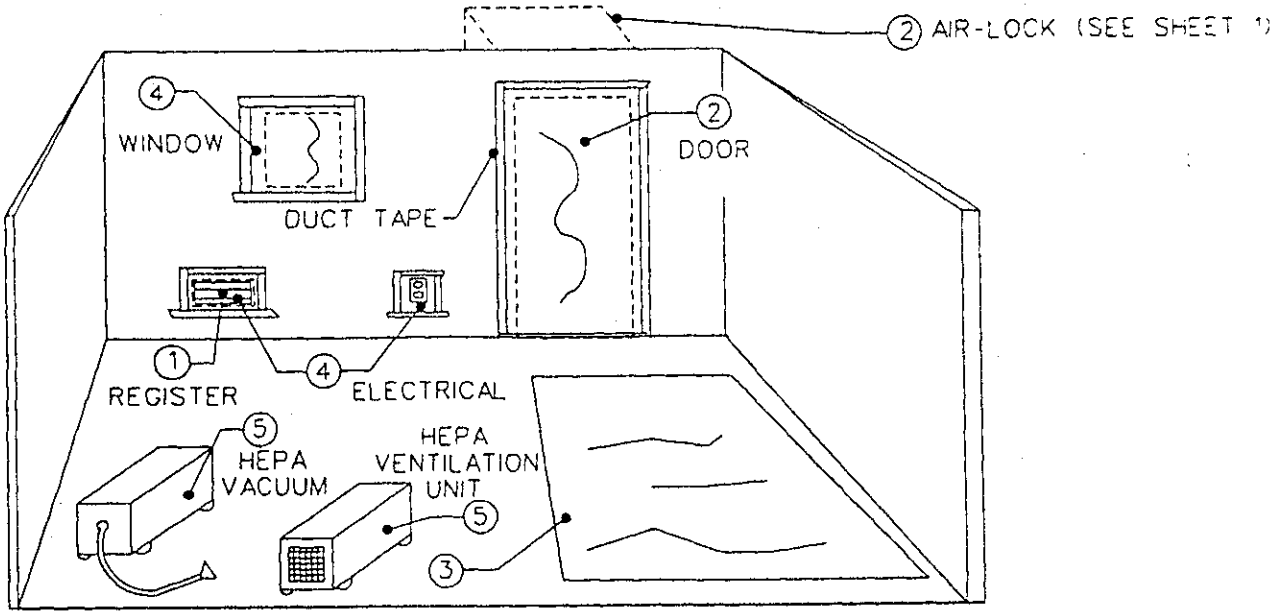
3. Wet wipe bags, equipment, and containers, and take to holding room.

4. Stage clean bags, equipment, and containers in holding room until disposal worker removes them.

5. Disposal workers, ~~wearing full protective clothing and appropriate respirator protection~~, carry decontaminated bags and containers ~~through~~ enclosed ~~walkway and into~~ truck or Dumpster.

Final clearance requirements. Before breaking down load-out unit, adequately wet clean and HEPA vacuum all surfaces and prepare area for final clearance. Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection*. Contractor will apply lockdown encapsulant. Contract designee(s) will conduct final air-clearance monitoring as required by the contract. Breakdown load-out area upon instructions from Contracting Officer. Treat as asbestos- contaminated material. Place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of as required by the contract.

IN ← CARTS TO



Modified containment area

1. Establish work area and prevent unauthorized entry; see sheet 11. Eliminate airflow into containment area by isolating all supply and return air ducts from mechanical system.

2. Install air lock at entrance to abatement area; see sheet 1. Air lock may be constructed either outside or inside of room. NOTE: Air lock is not required for glove bag operations.

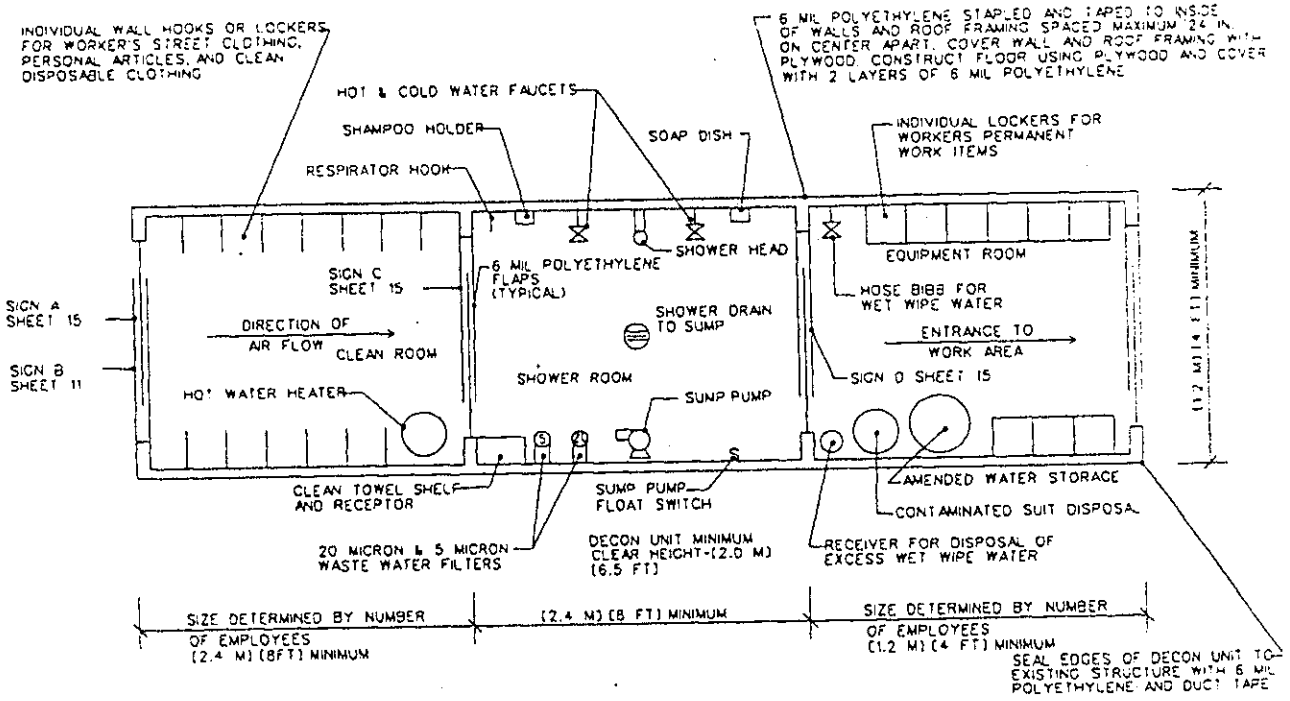
3. Install 6-mil polyethylene sheet on floor under work area.

4. Install 6-mil polyethylene (critical barrier) over all windows, doors, wall openings, electrical outlets, etc. Provide airtight seal, using duct tape.

5. Provide a HEPA-filter vacuum cleaner and a HEPA-filter ventilation system in the work area; see sheet 8. The ventilation system does not have to be ducted to the outside of the structure. The ventilation system shall operate 24 hours a day from start of abatement through final air-clearance monitoring. The ventilation system shall be sized to recirculate the air a minimum of four air changes per hour. For glove bag operations, provide a single HEPA ventilation unit with a measured capture velocity at least 1,500 cfm.

6. Accumulate all loose material and polyethylene from floor. Place in approved container; see sheet 9. Apply labels; see sheet 14. HEPA vacuum and adequately wet clean all wall, floor, and equipment surfaces.

Final clearance requirements. Abatement worker must wear two disposable suits. Remove outer suit in the work area. Place suit in 6-mil disposal bag; see sheet 9. Enter air lock. In air lock, wet wipe respirator and wash hands with clean water from portable sprayer. Remove respirator and place in clean plastic bag. Proceed to remote shower where inner suit may be removed. Prepare work area and air lock for final clearance. Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection*. Contract designee(s) will conduct final air-clearance monitoring as required by the contract. Upon instructions from the Contracting Officer, remove critical barriers and HEPA ventilation units; see sheet 8. Treat polyethylene as asbestos-contaminated material. Place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of as required by the contract.



Decontamination unit floor plan

1. Establish work area so that unauthorized entry is prevented; see sheets 11 and 15. Before entering the work area, all personnel shall remove their street clothing in the clean room and put on protective clothing and respirator.

2. Whenever exiting the work area, all personnel shall:

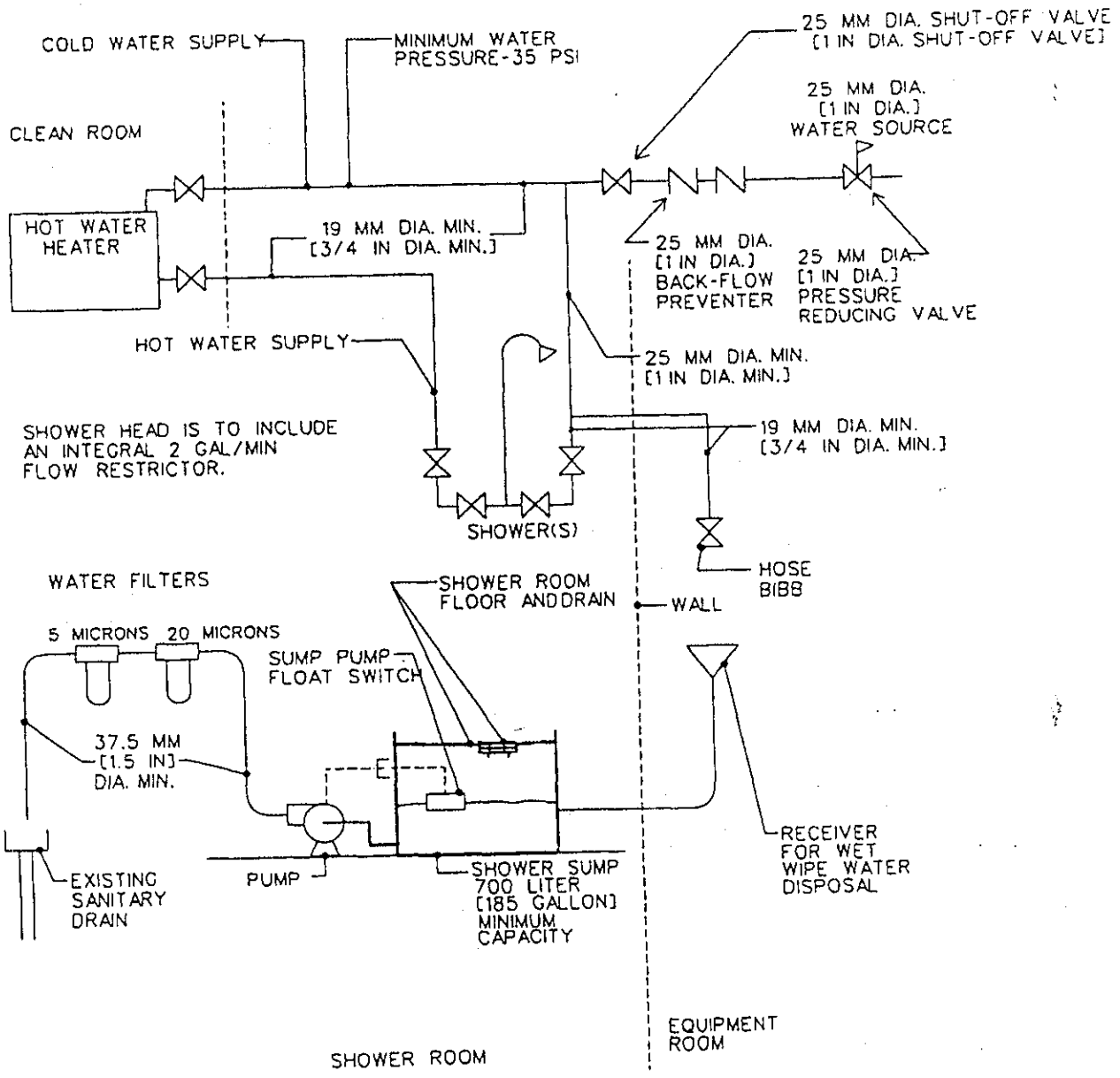
- Vacuum clothing and shoes outside equipment room.
- Remove all clothing and equipment (except respirator) in equipment room.
- Store work shoes and equipment in locker.
- With respirator still on, shower thoroughly, including hair. Then remove respirator and finish shower.
- Proceed to clean room and put on street clothes.

3. See sheet 23 for minimum plumbing requirements, including wastewater filtration. Ensure that plumbing and specified filter size meet local requirements.

4. Twice daily, or more often if necessary, and before breaking down decontamination unit after abatement, adequately wet clean and HEPA vacuum all wall, floor, equipment, and other surfaces. Waste collected in shower room and equipment room shall be treated as asbestos-contaminated material. Place in approved container; see sheet 9. Apply labels; see sheet 14.

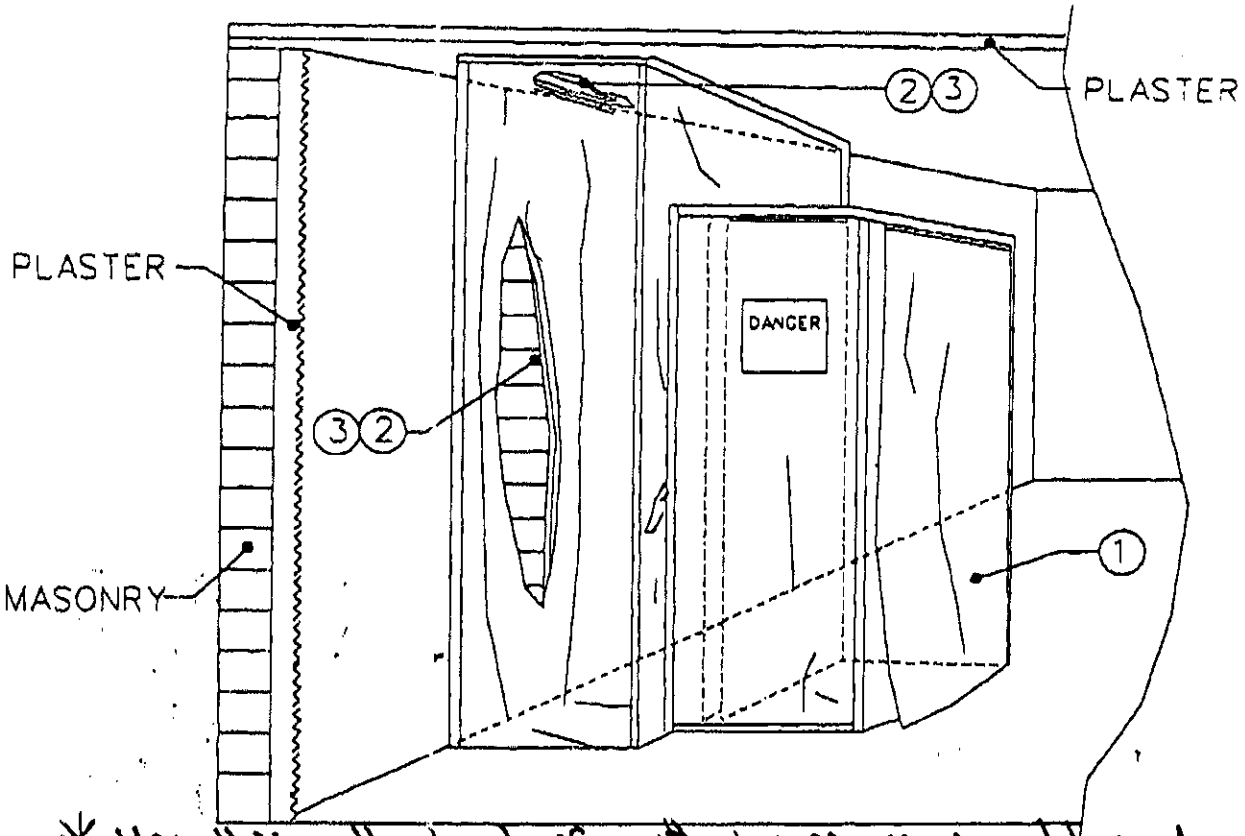
5. Prepare for final clearance.

Final clearance requirements. Contractor and Contracting Officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection.* Contract designee(s) will conduct final air-clearance monitoring as required by the contract. If the unit is not a prefabricated decontamination unit, apply lockdown encapsulant before final air-clearance monitoring. After approval of final air clearance, break down and treat polyethylene as asbestos-contaminated material. Place in approved container; see sheet 9. Apply labels; see sheet 14. Dispose of as required by the contract.



SIZE CAPACITY OF SUMP PUMP FOR TWICE THE EXPECTED WASTE WATER FLOW.

Decontamination unit piping details



* Use this method only if written variance is obtained from Colorado DPHE. Otherwise use full containment as indicated on other sheets for various wall types.

* Removal of small item from contaminated wall cavity or make a clean opening to install small item.

~~Repair of troweled ceiling or wall plaster on masonry~~

1. Prepare mini-containment area as specified on sheet 7. *

2. Adequately wet mist damaged plaster with amended water, initially and during removal procedure.

3. Remove damaged material. Place in approved container; see sheet 9. Apply labels: see sheet 14.

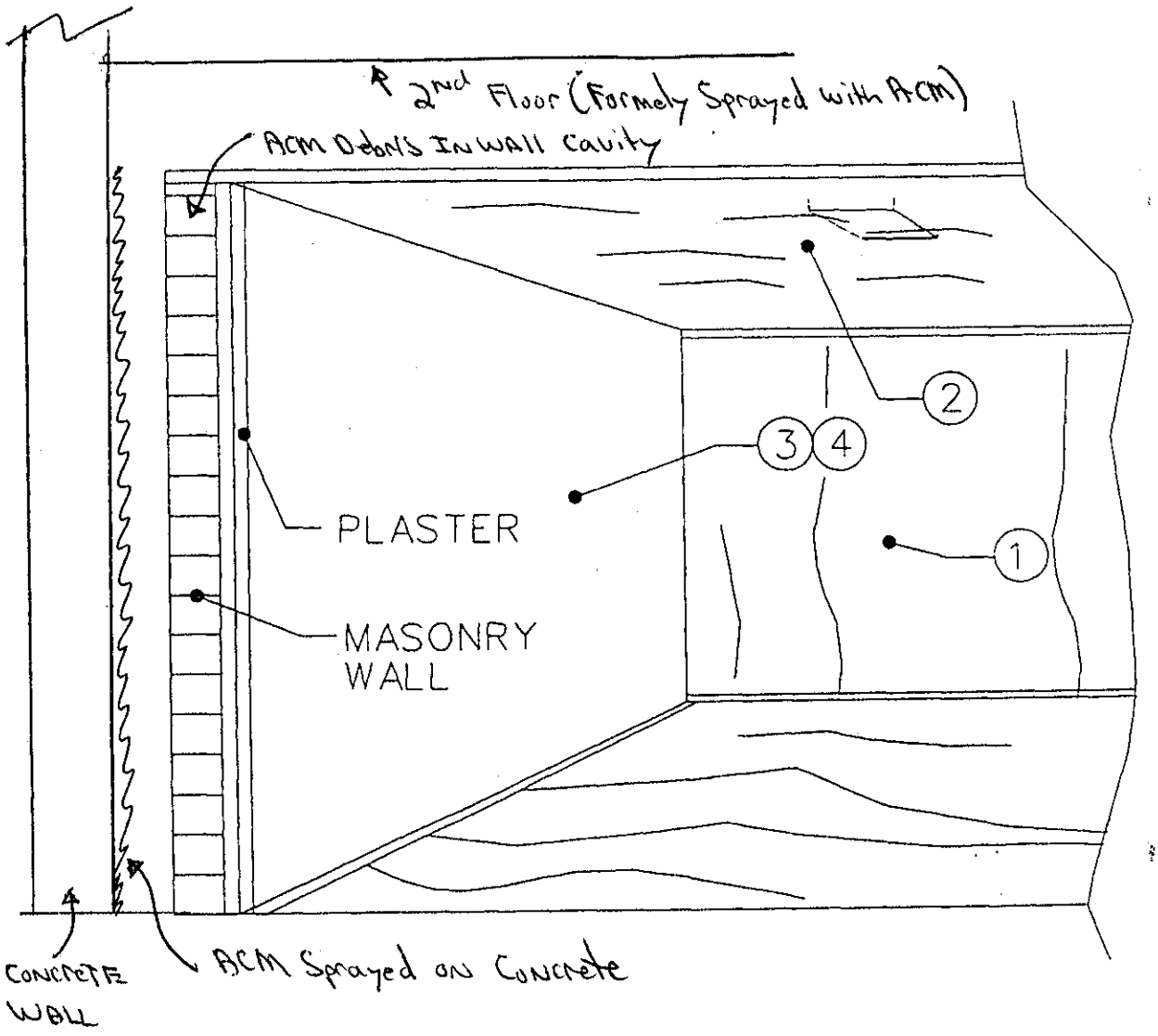
4. Repair damaged area by troweling on asbestos-free plaster, and then damp sponge. Match adjacent surfaces.

5. Apply tinted penetrating encapsulant by airless spray to repaired surface in accordance with manufacturer's recommendations.

6. Inspect and reapply encapsulant as necessary.

7. Prepare area for final air clearance.

8. Carry out final clearance requirements specified on sheet 7.



Removal of troweled wall plaster on masonry and Decontamination of wall cavity.

1. Prepare containment area as specified on applicable sheet 2, 3, 4, or 5.

2. Prepare ceiling as follows:

   - Cover light fixture with 6-mil polyethylene.
   - Protect entire suspended ceiling system with 6-mil polyethylene.

3. Adequately wet mist surface of plaster with amended water, initially and during removal procedure.

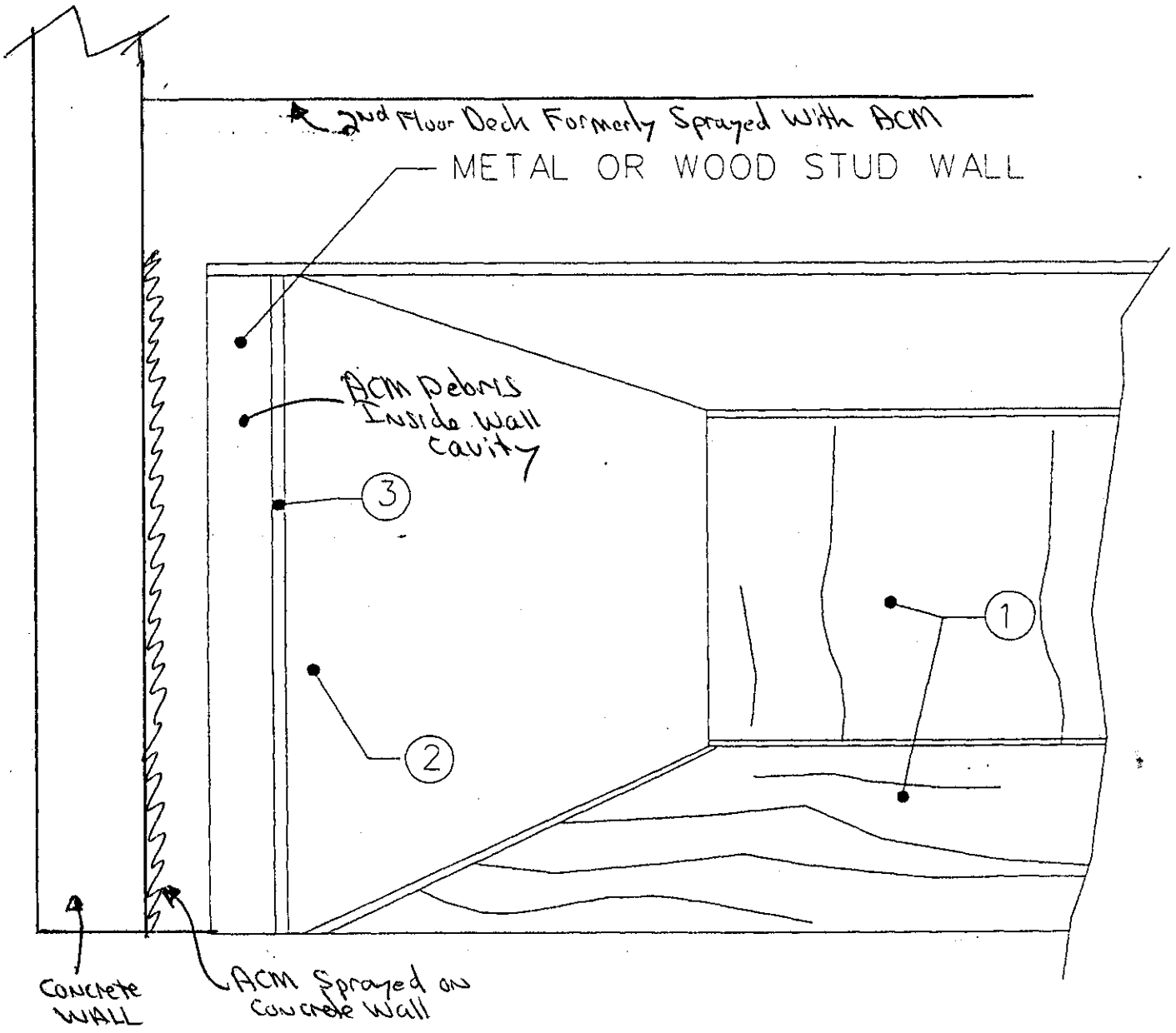
4. Remove plaster on masonry. Brush, HEPA vacuum, and wet wipe surface in order to remove remaining laitance and residue. Place removed asbestos-containing material in approved container; see sheet 9. Apply labels; see sheet 14.

5. Apply tinted penetrating encapsulant by airless spray in accordance with manufacturer's recommendations.

6. Inspect and reapply encapsulant as necessary.

7. Prepare area for final air clearance.

8. Carry out final clearance requirements specified on applicable sheet 5, 16, 17, or 18.



Removal of troweled wall plaster on stud wall and Decontamination of Wall Cavity.

1. Prepare containment area as specified on applicable sheet 2, 3, 4, 5, or 6.

2. Adequately wet mist damaged plaster with amended water, initially and during removal procedure.

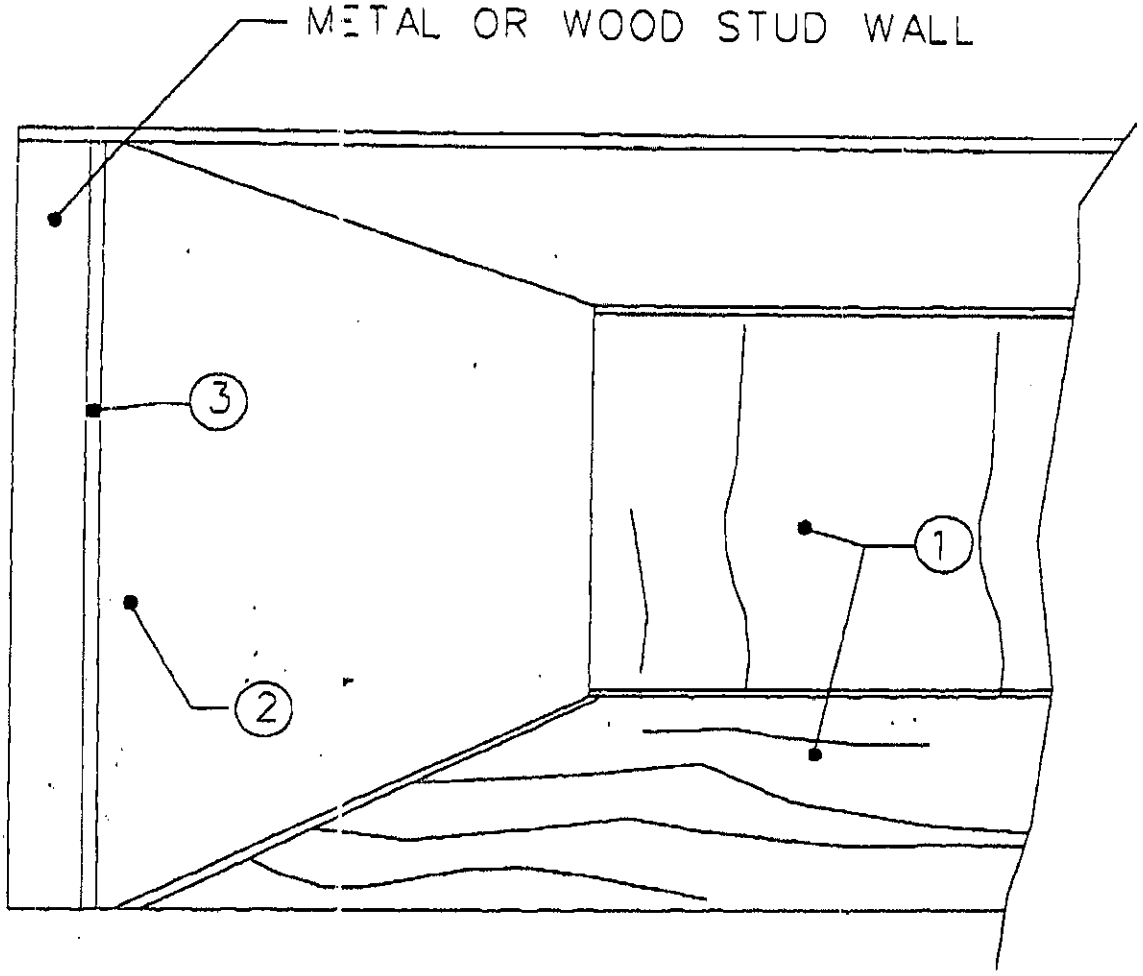
3. Remove plaster and lath from studs in manageable pieces. Stack the pieces onto two layers of 6-mil polyethylene. Wrap each polyethylene layer around the stack, sealing all joints and edges with duct tape; see sheet 9B for leak-tight wrapping. Apply labels; see sheet 14. Place smaller material in approved container; see sheet 9. Apply labels; see sheet 14.

4. Clean, HEPA vacuum, and adequately wet clean.

5. Apply tinted penetrating encapsulant. Inspect and reapply encapsulant as necessary.

6. Prepare area for final air clearance.

7. Carry out final clearance requirements as specified in the applicable sheet 5, 6, 16, 17, or 18.



Removal of ~~crowsfoot wall plaster~~ Gypsum Board AND ACM Joint Compound on stud wall

1. Prepare containment area as specified on applicable sheet 2, 3, 4, 5, or 6.

2. Adequately wet mist ~~damaged plaster~~ drywall with amended water, initially and during removal procedure.

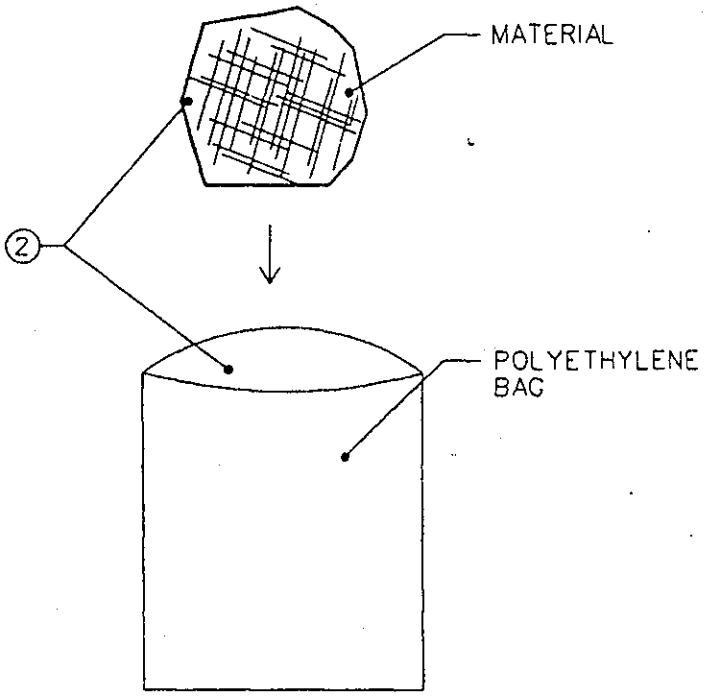
3. Remove ~~plaster and lath~~ drywall from studs in manageable pieces. Stack the pieces onto two layers of 6-mil polyethylene. Wrap each polyethylene layer around the stack, sealing all joints and edges with duct tape; see sheet 98 for leak-tight wrapping. Apply labels; see sheet 14. Place smaller material in approved container; see sheet 9. Apply labels; see sheet 14.

4. Clean, HEPA vacuum, and adequately wet clean.

5. Apply tinted penetrating encapsulant. Inspect and reapply encapsulant as necessary.

6. Prepare area for final air clearance.

7. Carry out final clearance requirements as specified in the applicable sheet 5, 6, 16, 17, or 18.



Removal of miscellaneous asbestos-containing materials

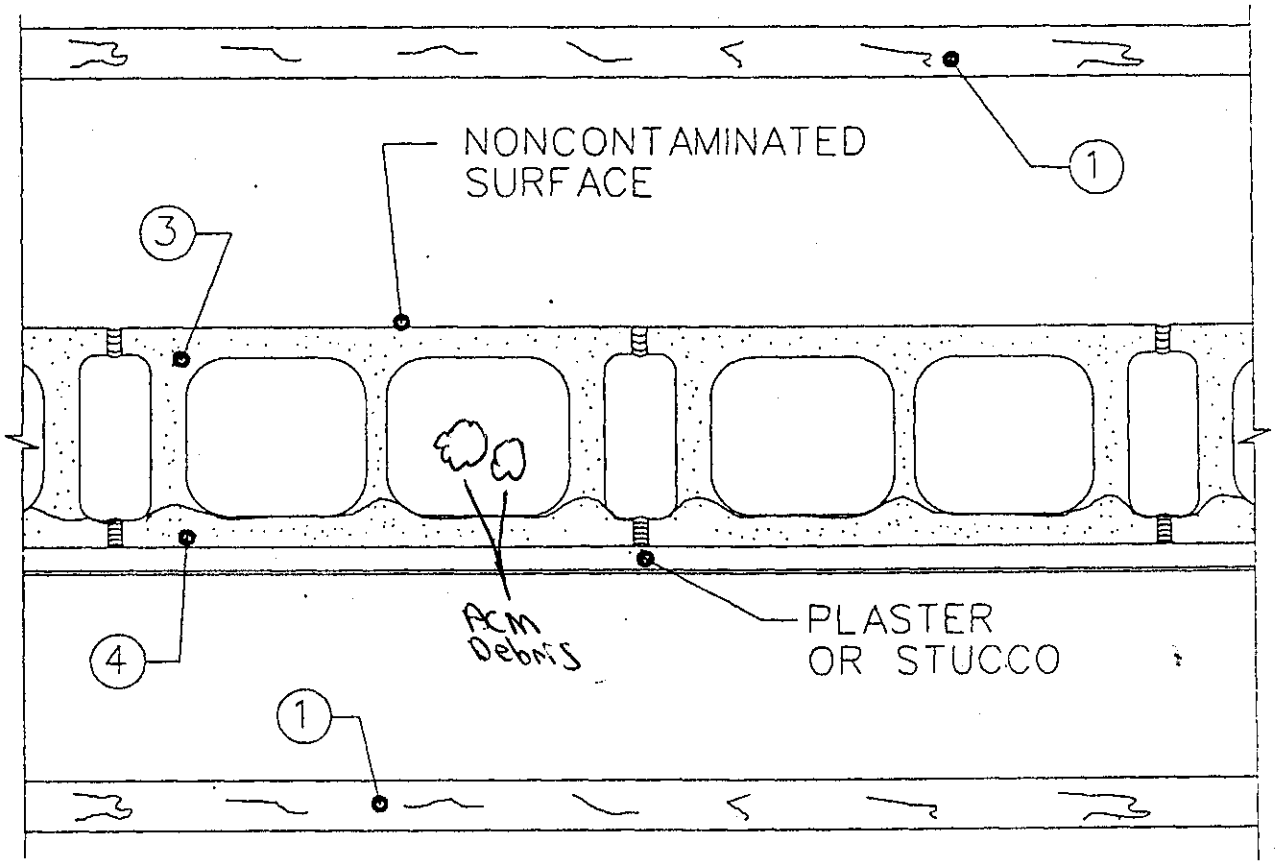
1. Establish work area so that unauthorized entry is prevented; see sheet 11. Prepare containment area as specified on sheet 21.

2. Adequately wet mist materials with amended water. Remove and place in approved container; see sheet 9. Apply labels; see sheet 14.

3. HEPA vacuum and wet wipe area in the immediate vicinity of removed materials.

4. Prepare area for final clearance.

5. Carry out final clearance requirements as specified on sheet 21.



Removal of asbestos-contaminated masonry wall~~, or thermal insulation~~

1. Prepare containment area as specified on sheet 6.

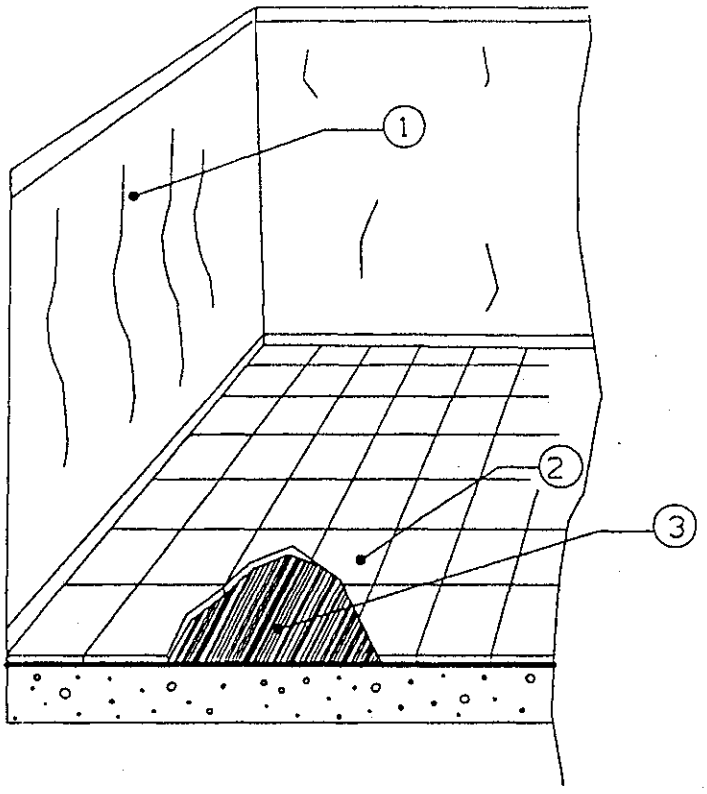
2. Adequately wet mist surface of plaster or stucco with amended water, initially and during removal procedure.

3. Demolish masonry wall.

4. Place contaminated masonry into a sealable rigid container; see sheet 9. Apply labels; see sheet 14.

5. Prepare area for final air clearance.

6. Carry out final clearance requirements as specified on sheet 6.



with adhered Acm mastic

Removal of vinyl [redacted]s tile and chemical dissolution of asbestos-containing adhesives on concrete floor system

1. Prepare containment area as specified on sheet 4.

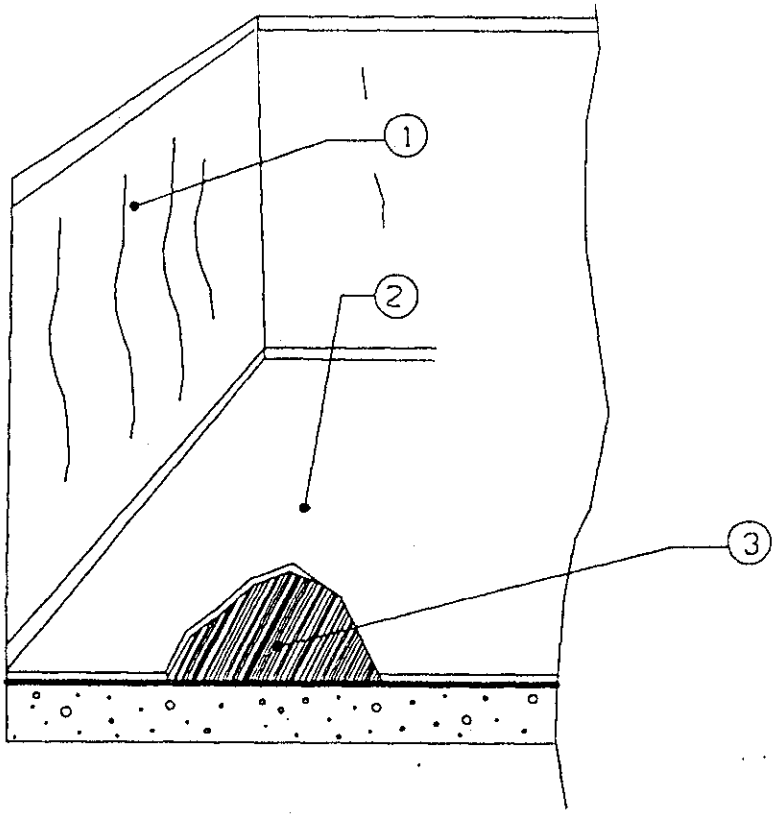
2. Lightly flood asbestos tile, and soak for 48 hours. Remove asbestos tile and adhesive while they are wet in order to prevent asbestos fiber release. Place tile and adhesive into an approved container; see sheet 9. Apply labels; see sheet 14.

3. Before removing adhesive, increase ventilation rate to 10 air changes per hour. Air must be exhausted outside building.

4. Apply liquid adhesive remover. As soon as the adhesive is soft enough to scrape, remove and put into approved container; see sheet 9. Apply labels; see sheet 14.

5. Prepare area for final air clearance.

6. Carry out final clearance requirements as specified on sheet 18.



Welded seam vinyl and

with adhered ACM mastic and chemical dissolution of ACM mastic

Removal of sheet-flooring adhered to concrete floor system ~~by asbestos-containing adhesive~~

1. Prepare containment area as specified on sheet 21. NOTE: Where full containment is required, follow instructions on sheet 4, except omit polyethylene on floor.

2. Mist exposed surfaces with amended water just before sheet flooring is removed. Remove flooring in manageable pieces and place on two layers of 6-mil polyethylene. Wrap each layer of polyethylene around the stack, sealing all joints and edges with duct tape; see sheet 9. Apply labels; see sheet 14. Place smaller material in approved container; see sheet 9. Apply labels; see sheet 14.

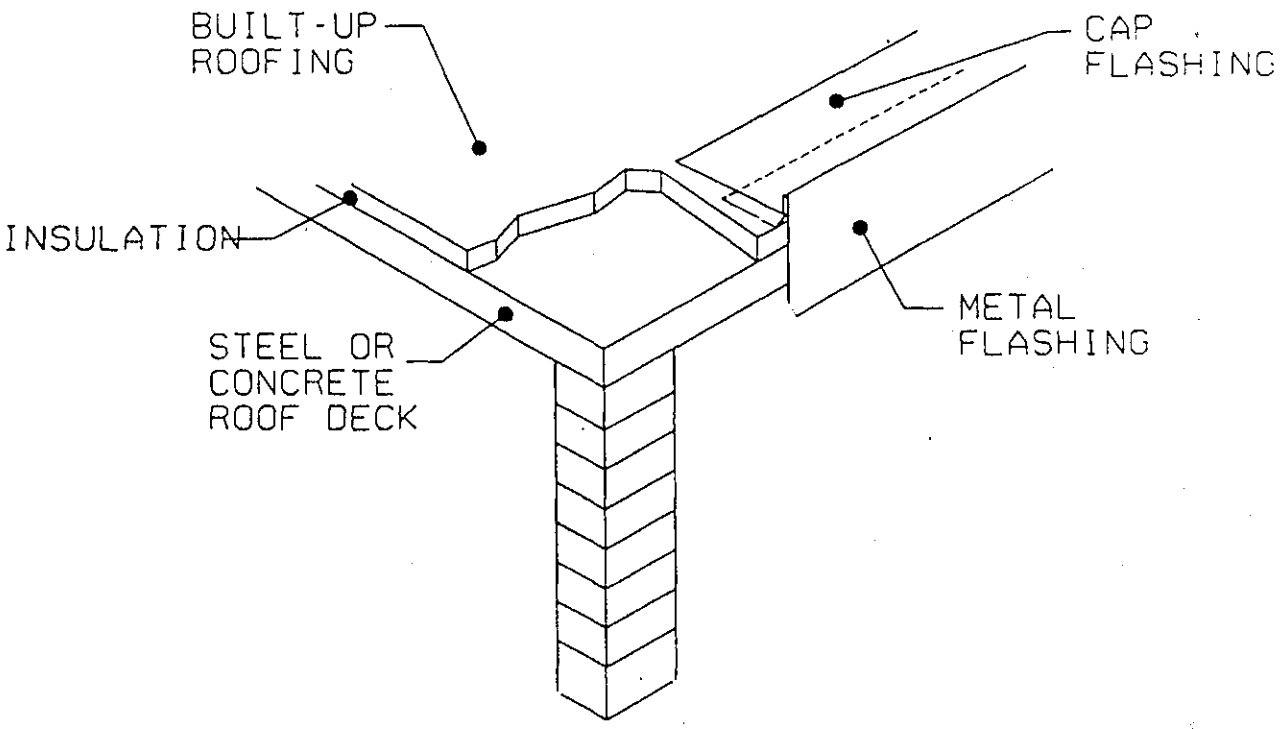
3. Remove remaining adhesive down to bare concrete. Place in approved container; see sheet 9. Apply labels; see sheet 14.

4. Clean, HEPA vacuum, and wet wipe all surfaces.

5. Inspect and reclean area as necessary.

6. Prepare area for final air clearance.

7. Carry out final clearance requirements specified on applicable sheet 18 or 21.



Removal of ~~built-up~~ roofing (Cement) and flashing

1. No containment area is required. Establish boundaries of asbestos-regulated work area so that unauthorized entry is prevented; see sheet 11. Provide personal protection and decontamination facilities as specified in contractor's asbestos hazard abatement plan.

2. Remove accumulated debris.

3. Adequately wet mist flashing and built-up roofing, initially and during removal procedures. Remove flashing and built-up roofing.

4. Dispose of all materials by carefully sliding them down an enclosed chute into an enclosed Dumpster or truck that is lined with two layers of 6-mil polyethylene. When the Dumpster or truck is filled, fold the polyethylene edges over each other and seal with duct tape; see sheet 9 for leak-tight wrapping. Apply labels; see sheet 14.

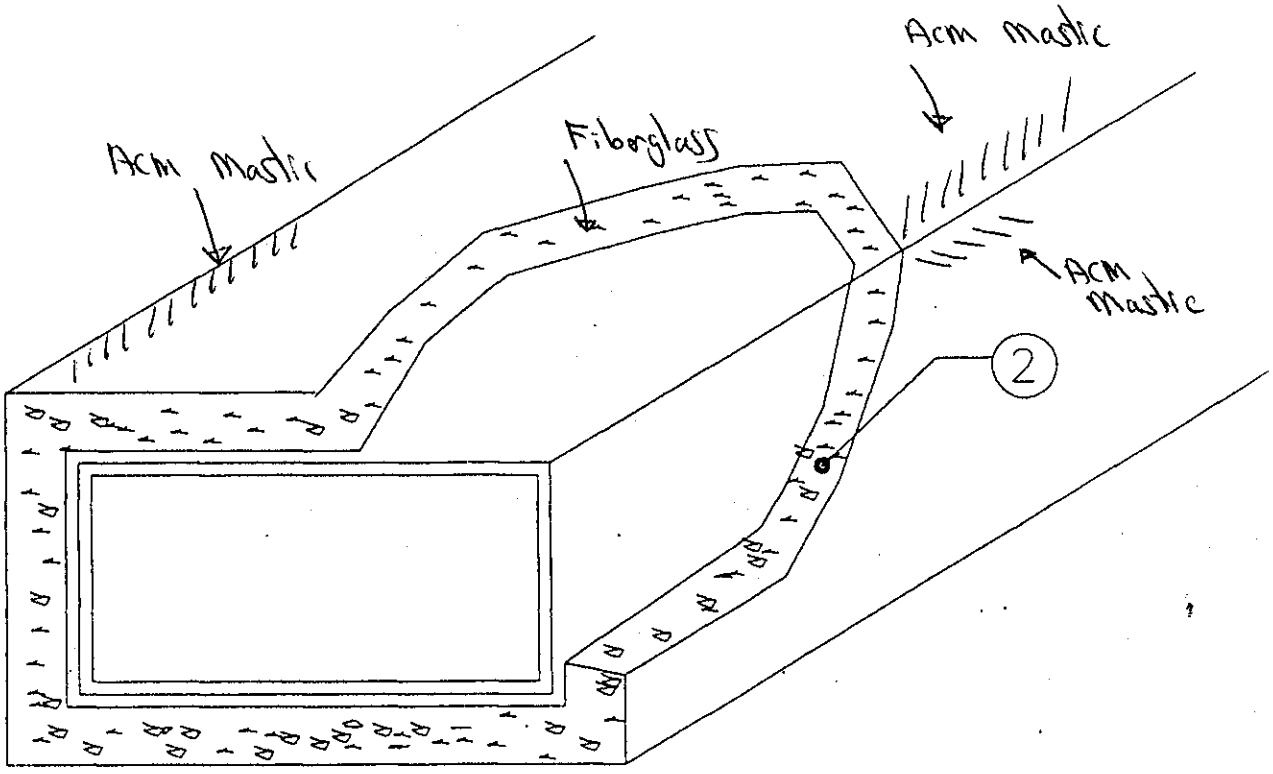
5. Clean and HEPA vacuum roof.

6. Inspect and reclean area as necessary.

7. Apply tinted penetrating encapsulant to exposed roof deck, using an airless sprayer. Inspect and reapply encapsulant as necessary.

8. Prepare area for final clearance.

9. Contractor and contracting officer will certify visual inspection of work area on sheet 19, *Certification of Final Cleaning and Visual Inspection.*



Removal of duct insulation

1. Prepare containment area as specified on applicable sheet 2, 3, or 4.

2. Adequately wet mist surface with amended water, initially and during removal procedure. Remove all asbestos insulation from duct. Place in approved container; see sheet 9. Apply labels; see sheet 14. Brush, HEPA vacuum, and wet wipe exposed duct surfaces to remove residual material.

3. Inspect and reclean area as necessary.

4. Apply tinted penetrating encapsulant. Inspect and reapply as necessary.

5. Prepare area for final air clearance.

6. Carry out final clearance requirements as specified on applicable sheet 16, 17, or 18.

HAZARDOUS MATERIALS
PRE-RENOVATION INSPECTION REPORT

ASBESTOS CONTAINING MATERIALS LEAD CONTAINING PAINTS
MERCURY & PCB CONTAINING LIGHTING

HOSPITAL ADDITION / ALTERATION
AIR FORCE ACADEMY
COLORADO SPRINGS, COLORADO

Prepared For:

ARMY CORP OF ENGINEERS
OMAHA DISTRICT

C/O

SHERLOCK, SMITH & ADAMS, INC.
P.O. BOX 11006
MONTGOMERY, ALABAMA 36111-0006

Conducted and Prepared by:

SHELBY CONSULTING SERVICES, INC.
P. O. BOX 1478
PELHAM, ALABAMA 35124

N. Glenn Ray
Vice President

November 2003

TABLE OF CONTENTS

APPENDICES:

1.0 PURPOSE AND SCOPE OF SERVICES

The purpose of this "Hazardous Materials Pre-renovation Inspection" was to locate and identify asbestos containing materials (ACM), lead containing paints (LCP), PCB containing lighting ballast, and mercury containing lighting lamps potentially affected by the anticipated work of the proposed project titled Hospital Addition / Alteration - U. S. Air Force Academy. This report was prepared by Shelby Consulting Services, Inc. (SCS) to support construction design developed by Sherlock, Smith, & Adams, Inc. (SSA). SCS agreed, under the subject contract to conduct the hazardous material identification and abatement design services in accordance with criteria specified by Army Corp of Engineers - Omaha District. A summary of the services to be provided under that Scope of Work is presented below:

A. Review any available records of ACM and LCP surveys, specific material testing, and abatement activities.
B. Identify and collect samples of accessible suspect building materials and paints which have not previously been identified as ACM or LCP and are anticipated to be damaged or significantly disturbed by the proposed renovation.
C. Perform a visual inspection to provide information on the suspect material's conditions, locations, and quantities of ACM affected by the proposed alterations. Those quantities are presented in the A/E's cost estimate and can be produced by bidders via the drawings which indicated ACM locations in an accurate manner on drawings with clearly indicated scales.
D. Analyze representative bulk samples for asbestos content utilizing Polarized Light Microscopy (PLM) and Dispersion Staining Techniques performed in accordance with EPA Bulk Analysis Method EPA/600/R-93/116.
E. Analyze representative paint samples for lead content utilizing appropriate EPA SW 846 Methods.
F. Visually inspect light fixtures, representative of each type and installation period, for the presence of labels indicating data pertinent to estimating the potential for mercury or PCB containing components.
G. Prepare preliminary demolition waste stream classification with respect to leachable lead content.
H. Make recommendations (specific to the proposed work) as to response actions pertaining to those materials identified as ACM (>1.0% asbestos content), those items coated with LCP; and lighting components that contain mercury or PCBs.
I. Assist Sherlock, Smith & Adams, Inc. (SSA) with preparation of abatement drawings, specifications, and cost estimates.
J. Compilation of a report (contained herein) which presents all sample results, details ACM, LCP, Mercury, and PCB descriptions, and generally identifies their locations and quantities in accordance with "Communication of Hazards" requirements pursuant to 29

CFR 1926.1101 and 29 CFR 1926.62.

2.0 REGULATIONS, STANDARDS & GUIDELINES

This section of the report outlines basic provisions of various regulations, standards, and guidelines related to ACM, LCP, PCB, and mercury associated with construction operations. Each paragraph includes a statement regarding the applicability of the subject matter to this inspection and the proposed renovation. *Note: This section has not been edited to reflect specifics of local regulations.*

2.1 ASBESTOS

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires the Owner or Operator of a facility to determine the presence or non-presence of asbestos containing materials prior to conducting renovation or demolition activities. The NESHAP Standard for asbestos (40 CFR Part 61 Sub-part M) requires the use of engineered control procedures for removal of asbestos materials that are or will become friable during renovation or demolition. The removal must occur before renovation or demolition activities impact those materials. This report and the associated inspections and testing satisfy the initial NESHAP requirements. Presentation of this report with the bidding package and or presentation of pertinent information in the contract drawings and specifications will complete the Owner / Operator discovery and communication requirements pursuant to the NESHAP. Removal, handling, and disposal of certain ACM identified herein must be provided in accordance with the NESHAP as locally administered and enforced.

On October 11, 1994 an OSHA promulgated regulation (29 CFR Part 1926.1101) became effective. This Standard is related to asbestos exposure in construction, renovation and building maintenance work places. Building owners are required, pursuant to section (k) "Communication of Hazards" of the Standard, to notify employees, tenants and prospective employers (e.g. construction bidders) of the descriptions, locations and quantities of ACBM in their buildings. Suspect materials installed not later than 1980 must be assumed to contain asbestos unless inspected and analyzed using "AHERA" protocol. The OSHA Standard applies, via Presidential Order, to work performed by employees of Federal agencies. Effective December 20, 2000 the OSHA standard also applies, via the 40 CFR 763 Subpart G (EPA Asbestos Worker Protection Rule), to work performed by employees of state and local agencies / governments in states without state run OSHA programs. Also the standard does apply to all work performed by other employers working for those agencies. Presentation of this report with the bidding package and or presentation of pertinent information in the contract drawings and specifications will complete the Owner / Operator discovery and

communication requirements pursuant to the OSHA Standard. Repair, removal, handling, and disposal of certain ACBM identified herein must be provided in accordance with the OSHA Standard.

In October 1986, the Asbestos Hazard Emergency Response Act (AHERA) was signed into law. Included in this act are provisions directing the EPA to establish rules and regulations (40 CFR Part 763) addressing asbestos-containing materials in schools. Specifically, the EPA was directed to address the issues of: 1) identifying, 2) evaluating, and 3) controlling asbestos containing materials (ACM) in schools. AHERA requires schools to perform building inspections and to prepare management plans for ACM control. The AHERA inspections must be conducted using specific guidelines which include analysis of a minimum number of samples, per material type, to prove that a suspect material does not contain asbestos. AHERA is not directly applicable to this project, but the building inspection methodology of the AHERA guidelines is to be used for compliance with certain parts of section (k) of 29 CFR 1926.1101. This ACM inspection was conducted using the applicable (per 29 CFR 1926.1101) portions of the AHERA criteria.

On November 28, 1992 a law became effective which extended the EPA's Model Accreditation Plan (MAP) to all public and commercial buildings. Currently the rule extends the accreditation requirements of MAP to persons performing asbestos work (inspectors, project designers, abatement supervisors, and workers) in public and commercial buildings, but does not extend the other aspects of AHERA. This project was conducted utilizing EPA/MAP accredited personnel.

2.2 LEAD

The OSHA regulates occupational exposure to lead, in the construction industry through the Lead Exposure in Construction Standard 29 CFR 1926.62. This standard applies to employers of persons potentially exposed to lead from construction operations. Employers shall assure that no employee is exposed to lead concentrations at or above the permissible exposure limit (PEL). Where the lead exposure resultant from a given work activity is not known the use of personnel protective equipment and engineered controls coupled with exposure monitoring are generally required at least until the exposure level is established. However, the OSHA Standard does not indicate what concentrations of lead in materials constitutes potential exposures in access of the PEL. This lack of specificity within the OSHA Standard creates a dilemma for determining applicability of the Standard to certain activities; particularly since worker exposure in excess of the PEL is virtually impossible when dealing with paints containing very low levels of lead. In response to questions concerning this issue OSHA has stated that any detectable concentration of lead may trigger certain provisions of 29 CFR 1926.62. Given the sensitivity of modern analytical equipment a result of 0.0% lead is very rare for paints manufactured prior to 1978. In consideration of

the OSHA Standard the contract documents should address lead containing paint (LCP) as opposed to lead-based paint (LBP) regulated by the EPA and HUD for certain activities associated with lead paint in Target Housing and Child Occupied Facilities. Presentation of this report with the bidding package and or presentation of pertinent information in the contract drawings and specifications will relieve the Bidder / Contractor of the burden of determining potential lead concentrations in paints affected by the proposed renovation activities. Removal and handling of the LCP identified herein must be provided in accordance with the OSHA Lead Standard which is administered and enforced by the Federal OSHA.

The federal standards specifically applicable to generators and transporters of hazardous waste are contained in 40 CFR Parts 262 and 263 respectively. 40 CFR 262.11 states that the person who generates a solid waste must determine if that waste is a hazardous waste. The definition of hazardous waste and the requirements for hazardous waste determination are contained in 40 CFR 261. The generator of waste on a construction / abatement project may be listed as either the owner / operator or the contractor; however, both parties share responsibility for regulatory compliance.

SCS has conducted an initial waste classification, with respect to leachable lead concentrations, in consideration of the anticipated waste stream, which is assumed to consist of whole building demolition debris, since there are no specific requirements to remove LCP from building components prior to demolition. Based upon our experience with similar projects it is highly unlikely that the EPA specified TCLP Method will indicate hazardous waste, with respect to leachable lead concentrations derived from painted building components to be demolished during this renovation project. As such, SCS has developed a preliminary waste determination, with respect to LCP within the overall building demolition debris. That determination is presented as Appendix 7 to this report, and the contractor for the subject project may rely upon that information to the extent allowed by the agency having authority in the area where the subject waste is disposed.

2.3 PCBs and Mercury

Lighting ballasts containing PCBs and lighting lamps containing mercury are classified as hazardous / universal waste and should be disposed of or recycled in accordance with applicable local requirements.

3.0 FACILITY CHARACTERISTICS

The existing Hospital Building # 4102 is essentially a five story concrete structure with built-up roof and brick exterior. The building has a basement which contains the main mechanical room, housekeeping, facilities management, and logistics functions. The first floor, which comprises,

by far, more space than any other floor, contains the emergency suite, operating suites, and most of the clinics. Floors 2 - 4 are basically a central tower containing the cafeteria, patient rooms, and admin offices respectively.

The subject project areas to be renovated encompass the entire fourth floor and a significant portion of the first floor in various sections. On the fourth floor most interior walls and ceilings will be demolished. The level of interior demolition varies between sections of the first floor to be altered. The entire MRI facility currently at the SE corner of the building will be demolished. Also major demolition will occur of the courtyard area to accommodate filling that open space with new construction at first floor elevation. Building 4106/4107 which is a series of modular units attached to a constructed in-place structure just west of Building 4102 will also be demolished. Additions will also tie into the south and east sides of the existing Building 4102 at first floor elevation.

Original interior walls were predominately plaster with metal lath attached to gypsum board on black metal channel studs or applied to clay tiles. However, many partitions have been completely demolished and replaced with gypsum board on metal studs (e.g. fourth floor) or covered by gypsum board. Original ceilings were predominately plaster but most have been removed and replaced with lay in acoustical tile and "T" grid systems. The floors are finished with a mixture of carpet, vinyl tile, sheet vinyl, and ceramic.

Most of the original mechanical and plumbing systems appear to have been replaced or at least reinsulated.

4.0 SURVEY METHODOLOGY

SCS was not required, by the contract "Scope of Work", to conduct a building wide comprehensive survey of all ACM and LCP. Rather, the goal was to address those materials anticipated to be impacted by the proposed work. Although no single comprehensive building wide asbestos survey was conducted by SCS, our investigation of the specific project areas should result in a "Pre-renovation Inspection" that meets the requirements of the aforementioned standards (NESHAP & OSHA). SCS's first step in the overall inspection process was to interview the Architectural and Engineering team in order to determine which items would be demolished or altered in order to accomplish the proposed additions and renovation work. The next step was to interview hospital facility management personnel and collect records of previous material testing, surveys, and abatement activities. Verbal information about past asbestos abatement activities was provided by the facility manager but no detailed records were available at the hospital.

After the interviews the affected building items were then visually inspected for the presence of material suspected to contain asbestos and paints suspected to contain lead. Once those suspect

materials were identified, bulk samples were obtained and placed into individual vials for transportation to NVLAP and AIHA accredited laboratories. General areas for sample locations were selected on a random basis with a preference for exact positioning at sites normally hidden from view and/or at sites with existing damage. Each sample was assigned a unique number and each sample location was recorded on floor plans. Those numbers directly correspond with the numbers listed on the laboratory reports in Appendices 1 & 2 and the summary tables presented as Appendices 3 & 4.

Only materials readily accessible within the project area were evaluated. Materials that were hidden and not accessible were not evaluated as part of this survey. If any additional suspect materials are identified during renovation or demolition they should be analyzed for asbestos and lead content. Materials visibly identifiable as non-asbestos (fiberglass, foam rubber, wood, etc.) were not sampled. All paints and primers were assumed to be potential lead containing materials.

Each time suspect ACM was sampled, it was classified as either a friable or a non-friable material. Friable material may be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACM is potentially more hazardous than non-friable ACM because friable material can release airborne asbestos fibers more easily. In assessing the fiber release potential, the current condition of all ACM identified was noted. Evidence of deterioration, physical damage, water damage, erosion of ACM due to its' proximity to an air plenum, high vibration, or contact potential was also noted.

Some paint testing was conducted by laboratory analysis after on-site paint chip sampling. Each time a suspect paint was sampled/tested, the condition of the paint was noted. The extent of flaking and resultant potential for contamination was also noted. Also dust wipe tests were conducted on 1 square foot patches at various surfaces scattered throughout the project areas. The purpose of dust wipe sample collection is to have then analyzed for lead content to provide additional data in assessing paint conditions and possible lead hazards. Also one soil sample was collected and analyzed for lead content. That sample was a composite of several spots around the perimeter of the building primarily in the areas where additions will occur.

5.0 LABORATORY ANALYSIS METHODOLOGY

Bulk building material samples were analyzed for the presence of asbestos, by using polarized light microscopy (PLM) and dispersion staining techniques in accordance with the EPA method EPA/600/R-93/116. This type of analysis requires the microscopist to take a portion of the bulk sample and treat it with an oil of specific refractive index. This prepared slide is then subjected to a variety of optical tests. Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Even though this is an estimation, any material that contains greater than one percent of any type of fibrous asbestos is considered ACM and must be handled according to OSHA and EPA

regulations if disturbed during maintenance, renovation, demolition or removal. PLM analysis was conducted Safety Environmental Laboratories, Inc. (SEL), EMSL Analytical, Inc., and Carolina Environmental all of which were NVLAP accredited at the time of respective analyses.

All paint samples were analyzed by Safety Environmental Laboratories, Inc. (SEL) at it's AIHA accredited metals laboratory by ICP equipment for lead content in accordance with EPA SW846 Method 7420. All lead dust wipe and lead soil samples were analyzed by R. J. Lee Group, Inc. using the same method but with FLAA equipment. Both of those firm's trace metals laboratories successfully participate in the Environmental Lead Proficiency Analytical Testing (ELPAT) program and both are accredited for lead in paint analysis under the AIHA administered Environmental Lead Laboratory Accreditation Program (ELLAP), which is an EPA approved accreditation program.

6.0 SUSPECT MATERIALS

6.1 ASBESTOS

The following is a general list of building materials that were suspected to contain asbestos. The materials are grouped into three categories according to general types as set forth in AHERA. A complete and more detailed description of these substances can be found in Appendix 3.

Surfacing (acoustical, decorative & fire resistant coatings)

- wall and ceiling plaster
- spray applied wall insulation
- spray applied deck roof insulation
- spray applied deck / ceiling fireproofing

Thermal System Insulation

- calciform insulations on steam pipes

Miscellaneous Material

- vinyl floor tiles
- sheet vinyl flooring
- mastics associated with vinyl flooring
- gypsum board
- drywall joint compounds

- ceiling tiles
- wall base adhesives
- asphaltic roofing membrane
- roof cement
- sink undercoating
- mastic applied to fiberglass insulation on roof drain pipes
- mastic applied to fiberglass insulation HVAC ducts
- mastic applied to fiberglass insulation on chilled water pipes
- mastic applied to fiberglass insulation on heating water pipes
- mastic applied to fiberglass insulation on domestic water pipes

6.2 LEAD

All paints, primers, and ceramic tile glazings applied to the major building components were considered potential sources of lead. No other types of materials (e.g. pipe solder) were tested for lead content. The paints which were sampled and tested are applied to following general building components:

- original plaster walls
- original plaster ceilings
- newer gypsum board walls
- newer metal door frames
- original metal door frame

7.0 ASBESTOS INSPECTION AND SAMPLING RESULTS

Details of all laboratory results can be found in Appendix 1. A listing of all suspect materials, their corresponding sample numbers, general locations, and asbestos content is presented in table form as Appendix 3. A total of 137 bulk samples have been collected and analyzed, by PLM. A narrative description of all "Friable ACM" and "Non-Friable ACM" identified during the survey, is given below. Locations and quantities of ACM affected by the proposed building alterations can be obtained from the accurately scaled construction drawings.

7.1 FRIABLE ACM

Those ACM identified during this Pre-renovation Inspection were classified as either friable or non-friable based upon their potential to be crumbled, pulverized or reduced to powder by hand pressure when dry. The following is a list of those ACM that can be crumbled, pulverized or reduced to powder by hand pressure when dry (i.e. friable):

- Friable spray applied insulation on inside face of concrete perimeter walls at first floor of the original building. This material is currently concealed by the interior partitions furred out from the perimeter walls. This material was not observed on any other floors of the building.

- Spray applied ceiling / deck fireproofing debris inside cavities of interior partitions and chases on the first floor in the original building area. This contamination appears to have occurred during former renovation and abatement projects and/or due to fallout from deterioration prior to abatement. This situation is known to exist in parts of the first floor as evidenced by existing warning labels at the tops of walls (e.g. area of Block 1P) and by sampling conducted during a 1997 investigation. ACM debris was observed inside wall cavities in other portions of the first floor where asbestos warning labels are not present. The affected areas are denoted on the contract drawings as Blocks 1C, 1D, 1E, 1J west of column line 13, 1K, 1L, 1M, 1N, & 1P. If a wall is constructed of plaster or clay tiles it is an original wall; however gypsum board has been applied over many of those walls from floor up to just above ceiling and all the way to the deck above in some locations. If a wall was originally constructed in a manner where the top was open then ACM is assumed to be inside even if it is not readily detectable by visual observation. Only original walls that extended to the deck and had mortar in the joint between the top clay tile course and the deck above are considered to be ACM free. Also walls that are completely new construction (i.e. gypsum board on metal stubs extending through the wall down to the floor) do not contain ACM debris.

- Drywall joint compound applied to gypsum board on all walls and scattered ceilings throughout the 1968 "L" shaped addition. This material is beige and representative of the 1968 construction but has been skimmed over by a newer white non-acm joint compound in some areas where walls have been renovated. Although the EPA recommends compositing gypsum board and joint compound as one wall system material; OSHA does not allow this approach and considers joint compound a distinct building material that must be analyzed separately. As such SCS has had the joint compound analyzed by three visual estimation methods: standard PLM, gravimetric PLM point counting, and TEM. All three produced results greater than 1% asbestos content in the joint compound.Note! Drywall joint compounds are often classified as non-friable when intact on the gypsum board. However this material will readily become friable during renovation and demolition activities, particularly where there are heavy applications such as corners.

7.2 NON FRIABLE ACM

Drywall joint compound applied to gypsum board on all walls and scattered ceilings throughout the 1968 L shaped addition. This material is beige and representative of the 1968 construction but has been skimmed over by a newer white non-acm joint compound in some areas where walls have been renovated. Although the EPA recommends compositing gypsum board and joint compound as one wall system material; OSHA does not allow this approach and considers joint compound a distinct building material that must be analyzed separately. As such SCS has had the joint compound analyzed by three visual estimation methods: standard PLM, gravimetric PLM point counting, and TEM. All three produced results greater than 1% asbestos content in the joint compound.

Note! Drywall joint compounds are often classified as non-friable when intact on the gypsum board. However this material will readily become friable during renovation and demolition activities, particularly where there are heavy applications such as corners.

7.2 NON FRIABLE ACM

Based upon physical inspections the following ACM were classified as non-friable:

- Non-friable old black flooring mastic on concrete slabs below newer non-asbestos vinyl tiles, vinyl sheet flooring, and carpet throughout the original building and the "L" shaped 1968 addition along the north and east sides. SCS pulled backed carpet in numerous locations and found black ACM mastic on the slab beneath clear/yellow non ACM carpet adhesives. SCS examined the back of the carpets and found that the black and yellow adhesives were stuck to the carpet. Also a sharp chisel was scraped along the floor and significant amounts of adhesive were peeled up onto the chisel blade. Where the thick welded seam pure vinyl flooring thinner laminate linoleum flooring were present SCS cut out small squares and looked at the back - again both yellow non-ACM adhesive and black ACM adhesives were stuck to the flooring. Ten mastic samples were collected in the original building areas and five mastic samples were collected from the "L" shaped 1968 addition - all samples contained > 1% asbestos.

NOTE! This floor mastic testing on the first floor included many locations away from the walls and corners and indicates that the condition is uniform throughout most of the first floor spaces. It is our understanding that previous projects were supposed to have removed the mastic. It is likely that only razor scraping was performed in leu of chemical dissolution in order to avoid unpleasant odors in the hospital. Razor scraping typically uses a blade about six inches wide and tends to only remove mastic from the high points. Much less black was observed on the fourth floor and the areas where it is concentrated enough to peel up tend to be small closets wall edges, and corners which is more consistent with the chemical dissolution removal method.

- Non-friable white mastic applied to fiberglass insulation on mechanical systems pipes and ducts, domestic water pipes, and roof drain pipes in the 1968 "L" shaped addition along the north and east sides.

- Non-friable black coating applied to underside of stainless steel sinks in various first floor spaces.

- Non-friable roof cement applied to flashings at parapets and expansion joints at Building 4106/4107.

Note! One sample of a dark brown wall base adhesive found throughout the 1968 "L" shaped addition was found to contain greater than 1% tremolite asbestos while some others were found to a trace of tremolite. Subsequent analysis of all of those samples determined that none contained greater than 1% asbestos by the gravimetric point count method. This material which is associated with the initial construction of that area is mixed with other non-acm adhesives representative of renovation projects. This material is not classified as ACM.

8.0 LEAD INSPECTION AND SAMPLING RESULTS

The results of the paint testing basically indicate that there are detectable concentrations of lead in all paints in all portions of the building. The highest lead concentrations were detected on the coatings applied to original metal door frames. The significance of lead concentrations is discussed in the following paragraph.

In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5% by weight in a dry film of newly applied paint. The CPSC lowered the allowable lead level in paint to 0.06% in 1978. To date the USEPA and HUD have developed the most comprehensive lead hazard identification and elimination programs which set the threshold lead level in paints at 0.5% by weight or 1.0 mg/cm2. However, the EPA and HUD standards do not apply to the work of this project. OSHA regulates occupational exposure to lead, but the allowable lead content in materials is not specified by that agency. However directives from OSHA indicate that any detectable concentration of lead may trigger certain provisions of 29 CFR 1926.62. Given the sensitivity (i.e. very low detection limit) of the testing methods commonly employed to identify lead in paint virtually all paints are found to contain some detectable concentration of lead. This situation appears to cause unnecessary application of the OSHA lead standard. However, employers are required by the 29 CFR 1926.62 to assume that where any lead is involved in workplace activities, the employees exposure will be above the PEL and shall protect them until an exposure assessment proves otherwise.

The only paints determined to contain lead above the EPA/HUD action thresholds are as follows:

- original metal door frames

In order to support SCS's position that the existing paints on surfaces to be significantly impacted by this project contain relatively low concentrations of lead and to further assess the potential for lead hazards SCS collected 13 dust wipe samples and 1 composite soil sample. The dust wipe samples were collected from a variety of surfaces above and below ceilings at the basement, 1st floor, 3rd floor, and 4th floor. The composite soil sample was collected from several spots around the building perimeter, particularly at sites where building additions will be constructed. Non of the samples were found to have lead in excess of the hazard threshold and lead abatement clearance standards established by the EPA and HUD for surfaces in residences where children 6 years of age and under reside. As such it is our opinion that the lead concentrations in the dust and soil at the subject project areas do not constitute a potential lead hazard for adult construction workers. Data related to the dust and soil testing is presented herewith as Appendix 4.

9.0 MERCURY & PCB LIGHTING INSPECTION RESULTS

Almost all flourescent light ballast manufactured prior to 1979 contain capacitors with regulated concentrations of PCBs. After 1978 manufactures were required to label ballast as containing "NO PCBs". EPA guidance documents state that if a ballast does not include the "NO PCBs" label, it should be assumed to contain PCBs. SCS has opened numerous light fixtures and inspected the ballast and found them to be labeled "No PCB" our review of renovation drawings coupled with our observations of the ceilings and exterior of the light fixtures indicate that almost all lights have been replaced after 1978.

To the best of our knowledge flourescent lamps are still being manufactured with mercury containing interior coatings. Therefore, it is our intent to assume all flourescent lamps contain mercury.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Only those ACM impacted by the proposed renovation work will be removed using abatement procedures and personnel. Requirements for the removal, handling, and disposal of ACM are incorporated into the contract documents. Large quantities of ACM may remain at the building after completion of the proposed work.

The contract documents will inform the contractor of his obligation to properly assess the potential lead exposure and protect his workers in accordance with 29 CFR 1926.62. However, it is not anticipated that removal / abatement of LCP will be required prior to the demolition of building components coated with LCP.

The contract documents will inform the contractor of his obligation to properly remove, handle, package, store, and recycle/dispose of the flourescent lamps.

In order to effectively address ACM and LCP to remain at the building an Operations and Maintenance Program should be established to maintain the materials in good condition and track them through future projects. This report should be made available to all persons potentially handling ACM and LCP at anytime in the future.

11.0 ASSUMPTIONS AND LIMITATIONS

The results, findings, conclusions and recommendations expressed in this report are based only on conditions which were observed during the inspections performed by SCS and the conditions anticipated as a result of the work proposed under the aforementioned renovation project.

Our inspection was generally non-destructive in nature. Any conditions or material which were not visible on the surface were not inspected and may differ from those observed. It was not within the scope of this investigation to remove surface materials to investigate portions of the structure or materials which lay beneath the surface. Our selection of sample locations and frequency is based upon our observations and the assumption that like materials in the same area are homogeneous.

This report is designed to aid the building owner, architect, construction manager, general contractors, and potential asbestos or lead abatement contractors in locating ACM and LCP. Under no circumstances is this report to be utilized as the sole bidding document.

APPENDIX 1

REPORTS OF LABORATORY ANALYSIS FOR ASBESTOS
BY PLM

SAFETY ENVIRONMENTAL LABORATORIES, INC.
3033 Lorna Road
Birmingham, Alabama 35216
(205)823-6200

BULK SAMPLE ANALYSIS REPORT
AIHA Lab Accreditation #9200
Polarized Light Dispersion Staining Method..
EPA/600/R-93/116 July 1993
This report shall not be reproduced except in full, without the written approval of the laboratory.

Client: SHELBY CONSULTING SERVICES, PELHAM, AL

Laboratory ID #: 09970429
Date Received: 9/5/97
Date Analyzed: 9/5/97
Date Reported: 9/12/97
Project Identification: FAMILY PRACTICE CLINIC ADDITION
AIR FORCE ACADEMY - COLORADO SPRINGS

SAMPLE NO.	DESCRIPTION/COLOR	****** ASBESTOS % ******				PERCENT OTHER MATERIAL			
		CHRY	AMOS	CROC	AC/TR	FBGL	MW	CELL	OTHER
A01	ASPHALTIC ROLL ROOFING, FIBROUS, HOMOGENEOUS, NON-FRIABLE, BLACK					30			70 TAR
A02	ACOUSTICAL TILE, FIBROUS, HOMOGENEOUS, FRIABLE, BEIGE					60		40	
A03	ACOUSTICAL CEILING TILE, FIBROUS, HOMOGENEOUS, FRIABLE, BEIGE					60		40	
A04	GYPSUM WALL BOARD, FIBROUS, HOMOGENEOUS, FRIABLE, WHITE							20	80 GYPSUM MINERALS
A05	WALL PLASTER, FIBROUS, HOMOGENEOUS, NON-FRIABLE, WHITE							5	55 CEMENT BINDER, 40 GRANULAR MINERALS
A06	ACOUSTICAL TILE ADHESIVE, NON-FIBROUS, HOMOGENEOUS, NON-FRIABLE, BROWN	TRACE							80 ADHESIVE COMPOUND, 20 GRANULAR MINERALS
A07	CEILING PLASTER, NON-FIBROUS, HOMOGENEOUS, FRIABLE, WHITE								50 QUARTZ MINERALS, 40 CALCIUM MINERALS, 5 BINDER, 5 MICA

Bulk Samples will be stored for 30 days and will then be disposed of in an approved EPA landfill.

CHRY = Chrysotile
CROC = Crocidolite
AMOS = Amosite
AC/TR = Actinolite/Tremolite
FBGL = Fibrous Glass
CELL = Cellulose
MW = Mineral Wool
PC = Point Counted

Analysis of floor tile or any other resinously bound materials by polarized light microscopy (PLM) using EPA Method 600/R-93/116 dated July 1993 may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. When analysis of such materials by the EPA PLM Method yields negative results for the presence of asbestos we recommend utilizing alternative methods of identification such as Gravimetry, XRD or AEM.

Samples Are Not Homogenized Prior to Analysis
Percentages Given Are Visual Estimates
Report Cannot Be Used to Claim Product Endorsement By NVLAP
Laboratory Not Responsible for Sampling Technique
Test Report Relates Only to Items Submitted
Laboratory's Friability Classification May Not Represent Field Conditions
Analytical Instrument: Olympus Polarizing Microscope BH-2 Model BHT-002

Norman W. Bowne
Laboratory Analyst

Respectfully Submitted, Norman W. Bowne
Laboratory Director

SAFETY ENVIRONMENTAL LABORATORIES, INC.
3033 Lorna Road
Birmingham, Alabama 35216
(205)823-6200

BULK SAMPLE ANALYSIS REPORT
AIHA Lab Accreditation #9200
Polarized Light Dispersion Staining Method..
EPA/600/R-93/116 July 1993
This report shall not be reproduced except in full, without the written approval of the laboratory.

Client: SHELBY CONSULTING SERVICES, PELHAM, AL

Laboratory ID #: 09970429
Date Received: 9/5/97
Date Analyzed: 9/5/97
Date Reported: 9/12/97
Project Identification: FAMILY PRACTICE CLINIC ADDITION
AIR FORCE ACADEMY - COLORADO SPRINGS

SAMPLE NO.	DESCRIPTION/COLOR	****** ASBESTOS % ******				PERCENT OTHER MATERIAL			
		CHRY	AMOS	CROC	AC/TR	FBGL	MW	CELL	OTHER
A08	DRYWALL JOINT COMPOUND, FIBROUS, NON-HOMOGENEOUS, FRIABLE, WHITE					10		35	50 GYPSUM MINERALS, 5 BINDER
A09	ACOUSTICAL CEILING TILE, FIBROUS, HOMOGENEOUS, FRIABLE, WHITE					40		30	20 PERLITE, 10 BINDER
A10	DRYWALL JOINT COMPOUND, NON-FIBROUS, HOMOGENEOUS, FRIABLE, WHITE								70 CARBONATE MINERALS 25 GRANULAR MINERALS, 5 BINDER
A11	CEMENTITIOUS COMPOUND, FIBROUS, NON-HOMOGENEOUS, FRIABLE, GREY	3				15			42 CEMENT BINDER, 40 MICA
A12	SPRAY APPLIED FIREPROOFING, FIBROUS, NON-HOMOGENEOUS, FRIABLE, GREY	10					80		10 GRANULAR MINERALS
A13	CEMENTITIOUS WALL BOARD, NON-FIBROUS, HOMOGENEOUS, FRIABLE, WHITE								90 CARBONATE MINERALS, 10 BINDER
A14	INSULATION MASTIC, FIBROUS, HOMOGENEOUS, NON-FRIABLE, WHITE							25	55 MASTIC, 20 GLASS CHIPS

Bulk Samples will be stored for 30 days and will then be disposed of in an approved EPA landfill.

CHRY = Chrysotile
CROC = Crocidolite
AMOS = Amosite
AC/TR = Actinolite/Tremolite
FBGL = Fibrous Glass
CELL = Cellulose
MW = Mineral Wool
PC = Point Counted

Analysis of floor tile or any other resinously bound materials by polarized light microscopy (PLM) using EPA Method 600/R-93/116 dated July 1993 may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. When analysis of such materials by the EPA PLM Method yields negative results for the presence of asbestos we recommend utilizing alternative methods of identification such as Gravimetry, XRD or AEM.

Samples Are Not Homogenized Prior to Analysis
Percentages Given Are Visual Estimates
Report Cannot Be Used to Claim Product Endorsement By NVLAP
Laboratory Not Responsible for Sampling Technique
Test Report Relates Only to Items Submitted
Laboratory's Friability Classification May Not Represent Field Conditions
Analytical Instrument: Olympus Polarizing Microscope BH-2 Model BHT-002

Norman W. Bourne
Laboratory Analyst

Respectfully Submitted, Norman W. Bourne
Laboratory Director

SAFETY ENVIRONMENTAL LABORATORIES, INC.
3033 Lorna Road
Birmingham, Alabama 35216
(205)823-6200

BULK SAMPLE ANALYSIS REPORT
AIHA Lab Accreditation #9200
Polarized Light Dispersion Staining Method..
EPA/600/R-93/116 July 1993
This report shall not be reproduced except in full, without the written approval of the laboratory.

Client: SHELBY CONSULTING SERVICES, PELHAM, AL

Laboratory ID #: 09970429
Date Received: 9/5/97
Date Analyzed: 9/5/97
Date Reported: 9/12/97
Project Identification: FAMILY PRACTICE CLINIC ADDITION
AIR FORCE ACADEMY - COLORADO SPRINGS

SAMPLE NO.	DESCRIPTION/COLOR	****** ASBESTOS % ******				PERCENT OTHER MATERIAL			
		CHRY	AMOS	CROC	AC/TR	FBGL	MW	CELL	OTHER
A15	DRYWALL JOINT COMPOUND, NON-FIBROUS, HOMOGENEOUS, FRIABLE, WHITE								70 CARBONATE MINERALS, 20 GRANULAR MINERALS, 10 BINDER
A16	DRYWALL JOINT COMPOUND, NON-FIBROUS, HOMOGENEOUS, FRIABLE, WHITE								70 CARBONATE MINERALS, 20 GRANULAR MINERALS, 10 BINDER
A17	PLASTER, NON-FIBROUS, HOMOGENEOUS, NON-FRIABLE, GREY								50 CEMENT BINDER, 50 QUARTZ MINERALS

Bulk Samples will be stored for 30 days and will then be disposed of in an approved EPA landfill.

CHRY = Chrysotile
CROC = Crocidolite
AMOS = Amosite
AC/TR = Actinolite/Tremolite
FBGL = Fibrous Glass
CELL = Cellulose
MW = Mineral Wool
PC = Point Counted

Analysis of floor tile or any other resinously bound materials by polarized light microscopy (PLM) using EPA Method 600/R-93/116 dated July 1993 may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. When analysis of such materials by the EPA PLM Method yields negative results for the presence of asbestos we recommend utilizing alternative methods of identification such as Gravimetry, XRD or AEM.

Samples Are Not Homogenized Prior to Analysis
Percentages Given Are Visual Estimates
Report Cannot Be Used to Claim Product Endorsement By NVLAP
Laboratory Not Responsible for Sampling Technique
Test Report Relates Only to Items Submitted
Laboratory's Friability Classification May Not Represent Field Conditions
Analytical Instrument: Olympus Polarizing Microscope BH-2 Model BHT-002

Norman W. Bourne
Laboratory Analyst

Respectfully Submitted, Norman W. Bourne
Laboratory Director

SAMPLE ANALYSIS REQUEST FORM

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL 35124

PROJECT NAME: Family Practice Clinic Addition

PROJECT LOCATION: Air Force Academy - Colorado Springs

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION	RESULT
PLM	A01	asphaltic roll roofing	
	A02	acoustical ~~ceiling~~ tile	
	A03	" ceiling "	
	A04	gypsum wall board	
	A05	wall plaster	
	A06	acoustical tile adhesive	
	A07	ceiling plaster	
	A08	drywall joint compound	
	A09	acoustical ceiling tile	
	A10	drywall joint compound	
	A11	cementious compound	
	A12	spray applied fireproofing	
	A13	cementious wall board	
	A14	insulation mastic	
	A15	drywall joint compound	
	A16	" " "	
	A17	plaster	
		LAB ID# 09970429	

RECEIVED
SEP 05 1997

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR 48 HOUR 72 HOUR (5 DAY)

CHAIN OF CUSTODY

SAMPLED BY:	RECEIVED BY:	TRANSPORTED BY:	LAB CUSTODY:
N. Glenn Ray		D. Glenn	
SIGNED:	SIGNED:	SIGN:	SIGN: T. Bowen
DATE: Sept. 02, 97	DATE:	DATE: Sept. 04, 97	DATE: 9-5-97

Westmont, NJ 609-858-4800 | Piscataway, NJ 908-981-0550 | Carle Place, NY 516-997-7251 | Manhattan, NY 212-290-0052 | Melbourne, FL 407-725-5223 | Ann Arbor, MI 313-668-6810 | San Mateo, CA 415-570-5401 | Smyrna, GA 770-333-6066 | Greensboro, NC 910-297-1487 | Houston, TX 713-686-3635

EMSL

Attn.: Glenn Ray
Shelby Consulting Services Inc
53 Huntmaster Lane
P O Box 1478
Pelham, AL 35124

Thursday, September 25, 1997

Ref Number: GA972771

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: Academy / 71047

SAMPLE	LOCATION	APPEARANCE	SAMPLE TREATMENT	ASBESTOS %	ASBESTOS TYPE	NONASBESTOS %	NONASBESTOS FIBROUS	NONASBESTOS %	NONASBESTOS NONFIBROUS
A06	Ceiling Tile Adhesive	Tan Non-Fibrous Homogeneous	Dissolved/Teased	5%	Chrysotile		None Detected	95%	Other
A10	Drywall Joint Compound	White Fibrous Homogeneous	Crushed/Teased		None Detected	2%	Cellulose	98%	Other
A11	Cementious Compound	White Fibrous Homogeneous	Crushed/Teased	10%	Chrysotile	15%	Min. Wool	75%	Other
A12	Cementious Compound				Not Submitted				
A13		White Fibrous Homogeneous	Crushed/Teased		None Detected	3%	Cellulose	97%	Other
A15	Drywall Joint Compuound	White Fibrous Homogeneous	Crushed/Teased		None Detected	5%	Cellulose	95%	Other

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples also analyzed by ELAP 198-1 Method

Greg Hanes
Analyst

Rachel Travis
Approved Signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. Floor tiles and wipes should be tested with either SEM or TEM. The above test report relates only to the items tested. This report may only be reproduced in full with written approval by EMSL. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. All "NVLAP" reports with NVLAP logo must contain at least one signature to be valid. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples. Analysis performed by EMSL of Georgia (NVLAP Air and Bulk #101048-1).

Westmont, NJ 609-858-4800 | Piscataway, NJ 908-981-0550 | Carle Place, NY 516-997-7251 | Manhattan, NY 212-290-0052 | Melbourne, FL 407-725-5223 | Ann Arbor, MI 313-668-6810 | San Mateo, CA 415-570-5401 | Smyrna, GA 770-333-6066 | Greensboro, NC 910-297-1487 | Houston, TX 713-686-3636

EMSL

Attn.: Glenn Ray
Shelby Consulting Services Inc
53 Huntmaster Lane
P O Box 1478
Pelham, AL 35124

Thursday, September 25, 1997

Ref Number: GA972771

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: Academy / 71047

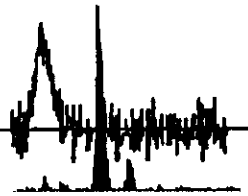
SAMPLE	LOCATION	APPEARANCE	SAMPLE TREATMENT	ASBESTOS %	ASBESTOS TYPE	NONASBESTOS %	NONASBESTOS FIBROUS	NONASBESTOS %	NONASBESTOS NONFIBROUS
A16	Drywall Joint Compuound	White Fibrous Homogeneous	Crushed/Teased	None Detected		5%	Cellulose	95%	Other

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples also analyzed by ELAP 198-1 Method

Greg Hanes
Analyst

Rachel Travis
Approved
Signatory



Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. Floor tiles and wipes should be tested with either SEM or TEM. The above test report relates only to the items tested. This report may only be reproduced in full with written approval by EMSL. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. All "NVLAP" reports with NVLAP logo must contain at least one signature to be valid. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.
Analysis performed by EMSL of Georgia (NVLAP Air and Bulk #101048-1).

ELECTRON MICROSCOPY SERVICES LABORATORY

1600 Roswell Street SE, Suite One, Smyrna, GA 30080 (770) 333-6066

Company Name: Shelby Consulting Services Inc.
Address: P.O. Box 1478
City: Pelham State: AL ZIP: 35124
Telephone: (205) 664-1313 FAX: (205) 664-1417
Results To: Glenn Ray
Project Name/Number: Academy / 71047
Purchase Order #:

Chain of Custody

Type Of Analysis (Please Check One)

TEM						PLM	BCM
AHERA ☐	Chatfield ☐	Qualitative ☐	Qualitative ☐	Air ☐		☒	☐
Level II ☐	Qualitative ☐	Quantitative ☐	Quantitative ☐	Wipe ☐			
7402 ☐	Quantitative ☐			Paint ☐			

TURNAROUND TIME (Circle One)

6 Hour Same Day 24 Hour (48 Hour) 72 Hour 5 Day 6-10 Day

*Please call in advance for RUSH sample analysis or large quantity

Sample ID	Location	Volume/Area (if applicable)
A06	ceiling tile adhesive	
A10	drywall joint compound	
A11	cementious compound	
A12	cementious compound	
A15	drywall joint compound	
A16	drywall joint compound	

Samples to be returned to client: _____ YES X NO Total Number Of Samples: 6

Relinquished By: N. Glenn Ray Date: Sept. 22, 97 Time: 8:00 AM

Received By: Rachel Lewis Date: 9/23/97 Time: 9:00 am

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: (919) 481-1413 Fax: (919) 481-1442

LABORATORY REPORT
ASBESTOS BULK ANALYSIS

Client: **Shelby Consulting Services, Inc.**
P.O. Box 1478
Pelham , AL 35124

Project: Air Force Academy Hospital

CEI Lab Code: A02-0821
Received: 02-12-02
Analyzed: 02-13-02
Reported: 02-13-02
Analyst: Gary A. Swanson

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A18	A10660A	FLOORING Homogeneous, White, Non-fibrous, Tightly Bound VINYL 100 %	ND
	A10660B	MASTIC Homogeneous, Black, Fibrous, Bound CHRY 10 % MAST 90 %	CHRY 10%
A19	A10661	CEILING TILE Heterogeneous, White, Beige, Fibrous, Loosely Bound PERL 27 % CELL 35 % PAINT 3 % FBGL 35 %	ND
A20	A10662	PIPE INSULATION MASTIC Heterogeneous, White, Fibrous, Loosely Bound BIND 25 % CELL 60 % FBGL 10 % WOLL 5 %	ND
A21	A10663	PIPE INSULATION MASTIC Homogeneous, White, Fibrous, Bound BIND 75 % FBGL 15 % WOLL 10 %	ND
A22	A10664	CEILING TILE Heterogeneous, White, Beige, Fibrous, Loosely Bound PERL 27 % CELL 35 % PAINT 3 % FBGL 35 %	ND

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A23	A10665	CEILING TILE Heterogeneous, White, Beige, Fibrous, Loosely Bound PERL 27 % CELL 35 % PAINT 3 % FBGL 35 %	ND
A24	A10666	JOINT COMPOUND Homogeneous, White, Non-fibrous, Bound BIND 100 %	ND
A25	A10667	PIPE INSULATION MASTIC Homogeneous, White, Non-fibrous, Bound BIND 90 % WOLL 10 %	ND
A26	A10668	PLASTER Heterogeneous, White, Brown, Non-fibrous, Bound BIND 100 %	ND
A27	A10669	PIPE INSULATION MASTIC Heterogeneous, Tan, Fibrous, Bound BIND 20 % FBGL 80 %	ND
A28	A10670	JOINT COMPOUND Homogeneous, White, Fibrous, Bound BIND 100 %	ND
A29	A10671	MASTIC Homogeneous, Black, Fibrous, Bound CHRY 3 % BIND 94 % CELL 3 %	CHRY 3 %
A30	A10672A	FLOORING Homogeneous, White, Non-fibrous, Tightly Bound VINYL 100 %	ND

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
	A10672B	MASTIC	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % BIND 95 %	
A31	A10673	ADHESIVE	ND
	Homogeneous,	Brown, Non-fibrous, Bound	
		BIND 100 %	
A32	A10674	MASTIC	CHRY 7 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 7 % BIND 93 %	
A33	A10675	PLASTER	ND
	Homogeneous,	White, Brown, Non-fibrous, Bound	
		BIND 100 %	
A34	A10676	MASTIC	CHRY 10%
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 10 % MAST 90 %	
A35	A10677	JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A36	A10678	MASTIC	CHRY 10%
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 10 % MAST 90 %	
A37	A10679	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A38	A10680A	FLOORING	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	
	A10680B	MASTIC	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % BIND 95 %	
A39	A10681	FLOOR TILE	ND
	Homogeneous,	Blue, Non-fibrous, Tightly Bound	
		VINYL 100 %	
A40	A10682A	FLOORING	ND
	Homogeneous,	Blue, Non-fibrous, Tightly Bound	
		VINYL 100 %	
	A10682B	MASTIC	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % MAST 95 %	
A41	A10683A	FLOORING	ND
	Homogeneous,	Blue, Non-fibrous, Tightly Bound	
		VINYL 100 %	
	A10683B	MASTIC	ND
	Homogeneous,	Yellow, Fibrous, Bound	
		MAST 97 % CELL 3 %	
A42	A10684	INSULATION MASTIC DUCT	ND
	Heterogeneous,	White, Fibrous, Bound	
		BIND 35 % CELL 50 %	
		FBGL 15 %	

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A43	A10685	INSULATION MASTIC PIPE	**ND**
	Homogeneous,	White, Fibrous, Bound	
		BIND 75 % WOLL 10 %	
		FBGL 15 %	
A44	A10686	PIPE INSULATION	**ND**
	Homogeneous,	Beige, Fibrous, Bound	
		BIND 90 % SYNT 10 %	
A45	A10687	INSULATION MASTIC	**CHRY 5 %**
	Homogeneous,	White, Fibrous, Bound	
		CHRY 5 % BIND 55 % CELL 30 %	
		FBGL 10 %	
A46	A10688	MASTIC	**CHRY 5 %**
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % BIND 95 %	
A47	A10689	MASTIC	**CHRY 5 %**
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % BIND 95 %	
A48	A10690	MASTIC	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % BIND 95 %	
A49	A10691	INSULATION MASTIC	**CHRY 5 %**
	Homogeneous,	White, Fibrous, Bound	
		CHRY 5 % BIND 55 % CELL 30 %	
		FBGL 10 %	
A50	A10692	CEILING TILE	**ND**
	Heterogeneous,	White, Beige, Fibrous, Loosely Bound	
		PAINT 3 % CELL 35 %	
		PERL 27 % FBGL 35 %	

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A51	A10693	JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A52	A10694	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	
A53	A10695A	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	
	A10695B	MASTIC	ND
	Homogeneous,	Yellow, Fibrous, Bound	
		BIND 90 % CELL 10 %	
A54	A10696	CEILING TILE	ND
	Heterogeneous,	White, Beige, Fibrous, Loosely Bound	
		PERL 27 % CELL 70 %	
		PAINT 3 %	
A55	A10697	JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A56	A10698	JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A57	A10699	JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A02-0821

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A58	A10700	MASTIC	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % MAST 95 %	
A59	A10701A	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Bound	
		VINYL 100 %	
	A10701B	MASTIC	ND
	Homogeneous,	Yellow, Non-fibrous, Bound	
		BIND 90 % CELL 10 %	

The following definitions apply to the abbreviations used in the ASBESTOS BULK ANALYSIS REPORT:

CHRY = Chrysotile	CELL = Cellulose	DEBR = Debris
AMOS = Amosite	FBGL = Fibrous Glass	BIND = Binder
CROC = Crocidolite	ORGN = Organics	SILI = Silicates
TREM = Tremolite	SYNT = Synthetics	GRAV = Gravel
ANTH = Anthophyllite	WOLL = Wollastonite	MAST = Mastic
ACTN = Actinolite	CERWL = Ceramic Wool	PLAS = Plaster
ND = None Detected	NTREM = Non-Asbestiform Tremolite	PERL = Perlite
NANTH = Non-Asbestiform Anthophyllite		RUBR = Rubber

CLIENT: Shelby Consulting Services, Inc.

PROJECT: Air Force Academy Hospital

CEI LAB CODE: A02-0821

Stereoscopic microscopy and polarized light microscopy coupled with dispersion staining is the analytical technique used for sample identification. The percentage of each component is visually estimated by volume. These results pertain only to the samples analyzed. The samples were analyzed as submitted by the client and may not be representative of the larger material in question. Unless notified in writing to return samples, Carolina Environmental, Inc. will discard all bulk samples after 30 days.

Many vinyl floor tiles have been manufactured using greater than 1% asbestos. Often the asbestos was milled to a fiber size below the detection limit of polarized light microscopy. Therefore, a "None Detected" (ND) reading on vinyl floor tile does not necessarily exclude the presence of asbestos. Transmission electron microscopy provides a more conclusive form of analysis for vinyl floor tiles.

It is certified by the signature below that Carolina Environmental, Inc. is accredited by the National Voluntary Accreditation Program (NVLAP) for the analysis of asbestos in bulk materials. The accredited test method is EPA / 600 / M4-82 / 020 for the analysis of asbestos in building materials. Procedures described in EPA / 600 / R-93 / 116 have been incorporated where applicable. The detection limit for the method is 0.1% (trace amount). Carolina Environmental, Inc.'s NVLAP accreditation number is #101768-0. This report is not to be used to claim product endorsement by NVLAP or any agency of the U. S. Government. This report and its contents are only valid when reproduced in full. Dust and soil analyses for asbestos using PLM are not covered under NVLAP accreditation.

ANALYST _____

REVIEWED BY _____

Tianbao Bai, Ph.D.
Laboratory Director

End of Report

A02-0821
A10660 - A10700
(42)

CHAIN OF CUSTODY RECORD

CLIENT ANALYSIS REQUEST

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Tel: 919-481-1413 • Fax: 919-481-1442

CLIENT : Shelby Consulting Services, Inc.	**PROJECT MGR.:** N. Glenn Ray
ADDRESS: P.O. Box 1478	**PHONE :** (205) 664-1313
Pelham AL 35124	**FAX :** (205) 664-1417

PROJECT/FACILITY	PROJECT CODE	ASBESTOS PLM	ASBESTOS PCM	LEAD WIPES	LEAD PAINT	LEAD SOIL
Air Force Academy Hospital		X				

REQUIRED TURN-AROUND

- ☐ 5 DAY
- ☐ 3 DAY
- ☒ 48 HOUR
- ☐ 24 HOUR
- ☐ 4 HOUR

CLIENT ID# 2403

REMARKS:

SAMPLES WILL BE DISPOSED OF 30 DAYS AFTER ANALYSIS, UNLESS OTHERWISE REQUESTED

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
N. Glenn Ray	2/11/2	3:30 PM	MDmond	2-12-02	10 AM
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:

(1) CLIENT COPY (2) LABORATORY COPY (3) ADMINISTRATIVE COPY

SAMPLE ANALYSIS REQUEST FORM

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL. 35124

PROJECT NAME: Air Force Academy Hospital

PROJECT LOCATION: Colorado Springs, Colorado

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION		RESULT
PLM	A18	vinyl flooring and black mastic	A060460	
	A19	ceiling tile	61	
	A20	pipe insulation mastic	62	
	A21	" " "	63	
	A22	ceiling tile	64	
	A23	" "	65	
	A24	drywall joint compound	66	
	A25	pipe insulation mastic	67	
	A26	wall plaster	68	
	A27	pipe insulation mastic	69	
	A28	drywall joint compound	70	
	A29	flooring mastic	71	
	A30	vinyl flooring and mastic	72	
	A31	wall base adhesive	73	
	A32	flooring mastic	74	
	A33	wall plaster	75	
	A34	flooring mastic	76	
	A35	drywall joint compound	77	
	A36	flooring mastic	78	
	A37	vinyl composition floor tile	79	
	A38	vinyl flooring and mastic	80	
	A39	vinyl floor tile	81	
	A40	" " " and mastic	82	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR (48 HOUR) 72 HOUR 5 DAY

CHAIN OF CUSTODY

SAMPLED BY:	RECEIVED BY:	TRANSPORTED BY:	LAB CUSTODY:
N. Glenn Ray		Fed. Exp.	
SIGNED:	SIGNED:	SIGN:	SIGN:
DATE: 2/10/02	DATE:	DATE:	DATE: 2-12-02

SAMPLE ANALYSIS REQUEST FORM

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL 35124

PROJECT NAME: Air Force Academy Hospital

PROJECT LOCATION: Colorado Springs, Colorado

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION		RESULT
PLM	A41	vinyl floor tile & mastic	A0083	
	A42	insulation mastic - duct	84	
	A43	insulation mastic - pipe	85	
	A44	Pipe Insulation	86	
	A45	insulation mastic	87	
	A46	flooring mastic	88	
	A47	flooring mastic	89	
	A48	" "	90	
	A49	insulation mastic	91	
	A50	ceiling tile	92	
	A51	drywall joint compound	93	
	A52	vinyl floor tile	94	
	A53	vinyl floor tile & mastic	95	
	A54	ceiling tile	96	
	A55	drywall joint compound	97	
	A56	" " "	98	
	A57	" " "	99	
	A58	flooring mastic	700	
	A59	vinyl floor tile and mastic	01	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR (48 HOUR) 72 HOUR 5 DAY

CHAIN OF CUSTODY

SAMPLED BY: N. Glenn Ray	RECEIVED BY:	TRANSPORTED BY: Fed Exp.	LAB CUSTODY:
SIGNED:	SIGNED:	SIGN:	SIGN:
DATE: 2/10/2	DATE:	DATE:	DATE:

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: (919) 481-1413 Fax: (919) 481-1442

LABORATORY REPORT
ASBESTOS BULK ANALYSIS

Client: **Shelby Consulting Services, Inc.**
P.O. Box 1478
Pelham , AL 35124

Project: Air Force Academy Medical Center
Colorado Springs, CO

CEI Lab Code: A02-3475
Received: 06-04-02
Analyzed: 06-06-02
Reported: 06-06-02
Analyst: Gary A. Swanson

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A60	A46651	INSULATION Homogeneous, White, Fibrous, Loosely Bound CHRY 15 % BIND 25 % FBGL 60 %	CHRY 15%
A61	A46652	SINK UNDERCOAT Homogeneous, Black, Fibrous, Loosely Bound CHRY 3 % MAST 97 %	CHRY 3 %
A62	A46653	SINK UNDERCOAT Homogeneous, Black, Fibrous, Loosely Bound MAST 100 %	ND
A63	A46654	SINK UNDERCOAT Homogeneous, Black, Fibrous, Loosely Bound MAST 100 %	ND
A64	A46655	SINK UNDERCOAT Homogeneous, Black, Fibrous, Loosely Bound MAST 100 %	ND
A65	A46656	INSULATION MASTIC Homogeneous, White, Non-fibrous, Bound BIND 70 % CELL 15 % WOLL 5 % FBGL 10 %	ND

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Medical Center
Colorado Springs, CO
Lab Code: A02-3475

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A66	A46657	CEILING TILE Homogeneous, White, Beige, Fibrous, Loosely Bound BIND 27 % CELL 35 % PAINT 3 % FBGL 35 %	ND
A67	A46658	WALLBOARD Homogeneous, Beige, Fibrous, Bound BIND 95 % FBGL 5 %	ND
A68	A46659	FLOOR TILE Homogeneous, Beige, Non-fibrous, Tightly Bound VINYL 100 %	ND
A69	A46660	SINK UNDERCOAT Homogeneous, Black, Non-fibrous, Tightly Bound MAST 100 %	ND
A70	A46661	CEILING TILE Heterogeneous, White, Beige, Fibrous, Loosely Bound PERL 27 % CELL 35 % PAINT 3 % FBGL 35 %	ND
A71	A46662	JOINT COMPOUND Homogeneous, White, Non-fibrous, Bound BIND 100 %	ND
A72	A46663	FLOOR TILE Homogeneous, Beige, Non-fibrous, Tightly Bound BIND 100 %	ND
A73	A46664	SINK UNDERCOAT Homogeneous, White, Fibrous, Bound BIND 80 % CELL 20 %	ND

CAROLINA ENVIRONMENTAL, INC.
102-H Commonwealth Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Medical Center
Colorado Springs, CO
Lab Code: A02-3475

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A74	A46665	FLOOR TILE	ND
	Homogeneous,	Blue, Non-fibrous, Tightly Bound	
		VINYL 100 %	
A75	A46666A	SURFACE TAR	CHRY 5 %
	Homogeneous,	Black, Fibrous, Bound	
		CHRY 5 % MAST 95 %	
	A46666B	FELTS	ND
	Homogeneous,	Black, Fibrous, Bound	
		TAR 70 % SYNT 20 %	
		FBGL 10 %	
A76	A46667	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	
A77	A46668	FLOOR TILE	ND
	Homogeneous,	White, Non-fibrous, Tightly Bound	
		VINYL 100 %	
A78A	A46669	INSULATION MASTIC	ND
	Homogeneous,	White, Brown, Fibrous, Bound	
		BIND 50 % CELL 30 %	
		FOIL 20 %	

The following definitions apply to the abbreviations used in the ASBESTOS BULK ANALYSIS REPORT:

CHRY = Chrysotile	CELL = Cellulose	DEBR = Debris
AMOS = Amosite	FBGL = Fibrous Glass	BIND = Binder
CROC = Crocidolite	ORGN = Organics	SILI = Silicates
TREM = Tremolite	SYNT = Synthetics	GRAV = Gravel
ANTH = Anthophyllite	WOLL = Wollastonite	MAST = Mastic
ACTN = Actinolite	CERWL = Ceramic Wool	PLAS = Plaster
N D = None Detected	NTREM = Non-Asbestiform Tremolite	PERL = Perlite
NANTH = Non-Asbestiform Anthophyllite		RUBR =Rubber

CLIENT: Shelby Consulting Services, Inc.

PROJECT: Air Force Academy Medical Center
Colorado Springs, CO

CEI LAB CODE: A02-3475

Stereoscopic microscopy and polarized light microscopy coupled with dispersion staining is the analytical technique used for sample identification. The percentage of each component is visually estimated by volume. These results pertain only to the samples analyzed. The samples were analyzed as submitted by the client and may not be representative of the larger material in question. Unless notified in writing to return samples, Carolina Environmental, Inc. will discard all bulk samples after 30 days.

Many vinyl floor tiles have been manufactured using greater than 1% asbestos. Often the asbestos was milled to a fiber size below the detection limit of polarized light microscopy. Therefore, a "None Detected" (ND) reading on vinyl floor tile does not necessarily exclude the presence of asbestos. Transmission electron microscopy provides a more conclusive form of analysis for vinyl floor tiles.

It is certified by the signature below that Carolina Environmental, Inc. is accredited by the National Voluntary Accreditation Program (NVLAP) for the analysis of asbestos in bulk materials. The accredited test method is EPA / 600 / M4-82 / 020 for the analysis of asbestos in building materials. Procedures described in EPA / 600 / R-93 / 116 have been incorporated where applicable. The detection limit for the method is 0.1% (trace amount). Carolina Environmental, Inc.'s NVLAP accreditation number is #101768-0. This report is not to be used to claim product endorsement by NVLAP or any agency of the U. S. Government. This report and its contents are only valid when reproduced in full. Dust and soil analyses for asbestos using PLM are not covered under NVLAP accreditation.

ANALYST _____

REVIEWED BY _____
Tianbao Bai, Ph.D.
Laboratory Director

End of Report

SAMPLE ANALYSIS REQUEST FORM

A07-4475

A46451-A46469

(19)

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL 35124

PROJECT NAME: Air Force Academy Medical Center

PROJECT LOCATION: Colorado Springs, Colorado

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION	RESULT
PLM	A60	spray applied insulation A46451	
	A61	sink undercoat 52	
	A62	" " 53	
	A63	sink undercoat 54	
	A64	" " 55	
	A65	insulation mastic 56	
	A66	ceiling tile 57	
	A67	wall board 58	
	A68	floor tile 59	
	A69	sink undercoat 60	
	A70	ceiling tile 61	
	A71	drywall joint compound 62	
	A72	floor tile 63	
	A73	sink undercoat 64	
	A74	floor tile 65	
	A75	built-up roofing 66	
	A76	floor tile 67	
	A77	floor tile 68	
	A78A	insulation mastic 69	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR (48 HOUR) 72 HOUR 5 DAY

-407

CHAIN OF CUSTODY

SAMPLED BY:	RECEIVED BY:	TRANSPORTED BY:	LAB CUSTODY:
N. Glenn Ray	N. Glenn Ray	Federal Express	
SIGNED:	SIGNED:	SIGN:	SIGN:
DATE: May 31, 02	DATE: June 03, 02	DATE: June 03/04, 02	DATE: 6-4-02

SAFETY ENVIRONMENTAL LABORATORIES, INC.
3033 Lorna Road
Birmingham, Alabama 35216
(205)823-6200

BULK SAMPLE ANALYSIS REPORT
AIHA Lab Accreditation #100766
Polarized Light Dispersion Staining Method...
EPA/600/R-93/116 July 1993
Interim Method for the Determination of Asbestos in Bulk Insulation Samples, 40 CFR, Part 763, Subpart F, Appendix A
This report shall not be reproduced except in full, without the written approval of the laboratory.

Client: **SHELBY CONSULTING SERVICES, INC., PELHAM, AL**

Laboratory ID #: **08020223**
Date Received: **08/05/02**
Date Analyzed: **08/07/02**
Date Reported: **08/13/02**
Project Identification: **AIR FORCE ACADEMY - MEDICAL CENTER**

SAMPLE NO.	DESCRIPTION/COLOR	****** ASBESTOS % ******				PERCENT OTHER MATERIAL			
		CHRY	AMOS	CROC	AC/TR	FBGL	MW	CELL	OTHER
A78 B	DUCT INSULATION MASTIC ROOM 1378, FIBROUS, HOMOGENEOUS, NON-FRIABLE, GREY	10						5	85 MASTIC
A79	DOMESTIC WATER INSULATION MASTIC ROOM 1378, FIBROUS, HOMOGENEOUS, NON-FRIABLE, GREY	10						5	85 MASTIC
A80	ROOF LEADER INSULATION MASTIC ROOM 1398, FIBROUS, HOMOGENEOUS, NON-FRIABLE, GREY	10						5	85 MASTIC

Upper detection limit: 100%. Lower detection limit <1%.
Bulk Samples will be stored for 30 days and will then be disposed of in an approved EPA landfill.

CHRY = Chrysotile
CROC = Crocidolite
AMOS = Amosite
AC/TR = Actinolite/Tremolite
FBGL = Fibrous Glass
CELL = Cellulose
MW = Mineral Wool
PC = Point Counted

Analysis of floor tile or any other resinously bound materials by polarized light microscopy (PLM) using EPA Method 600/R-93/116 dated July 1993 may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. When analysis of such materials by the EPA PLM Method yields negative results for the presence of asbestos we recommend utilizing alternative methods of identification such as Gravimetry, XRD or AEM.

Samples Are Not Homogenized Prior to Analysis
Percentages Given Are Visual Estimates
Report Cannot Be Used to Claim Product Endorsement By AIHA
Laboratory Not Responsible for Sampling Technique
Test Report Relates Only to Items Submitted
Laboratory's Friability Classification May Not Represent Field Conditions
Analytical Instrument: Olympus Polarizing Microscope BH-2 Model BHT-002

Greg Hayes
Laboratory Analyst

Respectfully Submitted, Rebecca J Hick
Laboratory Manager Designee, Rebecca J. Hic

SAFETY ENVIRONMENTAL LABORATORIES, INC.
3033 Lorna Road
Birmingham, Alabama 35216
(205)823-6200

BULK SAMPLE ANALYSIS REPORT
AIHA Lab Accreditation #100766
Polarized Light Dispersion Staining Method...
EPA/600/R-93/116 July 1993
Interim Method for the Determination of Asbestos in Bulk Insulation Samples, 40 CFR, Part 763, Subpart F, Appendix A

This report shall not be reproduced except in full, without the written approval of the laboratory.

Client: **SHELBY CONSULTING SERVICES, INC., PELHAM, AL**

Laboratory ID #: **08020223**
Date Received: **08/05/02**
Date Analyzed: **08/07/02**
Date Reported: **08/13/02**
Project Identification: **AIR FORCE ACADEMY - MEDICAL CENTER**

SAMPLE NO.	DESCRIPTION/COLOR	****** ASBESTOS % ******				PERCENT OTHER MATERIAL			
		CHRY	AMOS	CROC	AC/TR	FBGL	MW	CELL	OTHER
A81	DOMESTIC WATER INSULATION MASTIC ROOM 1384, FIBROUS, HOMOGENEOUS, NON-FRIABLE, GREY	10						5	85 MASTIC

Upper detection limit: 100%. Lower detection limit <1%.
Bulk Samples will be stored for 30 days and will then be disposed of in an approved EPA landfill.

CHRY = Chrysotile
CROC = Crocidolite
AMOS = Amosite
AC/TR = Actinolite/Tremolite
FBGL = Fibrous Glass
CELL = Cellulose
MW = Mineral Wool
PC = Point Counted

Analysis of floor tile or any other resinously bound materials by polarized light microscopy (PLM) using EPA Method 600/R-93/116 dated July 1993 may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. When analysis of such materials by the EPA PLM Method yields negative results for the presence of asbestos we recommend utilizing alternative methods of identification such as Gravimetry, XRD o AEM.

Samples Are Not Homogenized Prior to Analysis
Percentages Given Are Visual Estimates
Report Cannot Be Used to Claim Product Endorsement By AIHA
Laboratory Not Responsible for Sampling Technique
Test Report Relates Only to Items Submitted
Laboratory's Friability Classification May Not Represent Field Conditions
Analytical Instrument: Olympus Polarizing Microscope BH-2 Model BHT-002

Greg Hayes
Laboratory Analyst

Respectfully Submitted, Rebecca J Hicks
Laboratory Manager Designee, Rebecca J. Hic

SAFETY ENVIRONMENTAL LABORATORIES, INC.
P.O. BOX 661076 (35266) * 3033 LORNA ROAD * BIRMINGHAM, AL 35216
PHONE (205) 823-6200 * FAX (205) 823-9066

CHAIN OF CUSTODY FORM

CLIENT: Shelby Consulting Svcs. Inc ADDRESS: Pelham AL

JOB NAME/PURCHASE ORDER: Air Force Academy - Medical Center

ANALYSIS REQUESTED: CIRCLE ONE (ASBESTOS BULK (PLM)) ASBESTOS AIR (PCM) LEAD (Pb)* ARSENIC (As) OTHER_____

*IF LEAD, PLEASE SPECIFY: 1) AIR 2) PAINT 3) TCLP 4) DUST WIPES - SPECIFY WIPE BRAND_____ 5) SOIL 6) WATER

TURN AROUND TIME REQUESTED: RUSH/SAME DAY 1-2 DAY (3-5 DAY) OTHER_____

SAMPLE #	LABORATORY ID#	SAMPLE DESCRIPTION/LOCATION	CONDITION OF SAMPLE
A78B	08020223	duct insul. mastic Room 1378	Good
A79		domestic water insul. mastic Room 1378	↓
A80		roof leader insul. mastic Room 1398	
A81		domestic water insul. mastic Room 1384	

SAMPLED BY: 7/10/2 SIGNATURE/DATE

SENT BY: 8/5/2 SIGNATURE/DATE

REC'D BY: Wendi McCarthy SIGNATURE/DATE/TIME 8/5/02 2:30

ANALYZED BY: 8-7-02 SIGNATURE/DATE

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: (919) 481-1413 Fax: (919) 481-1442

LABORATORY REPORT
ASBESTOS BULK ANALYSIS

Client: **Shelby Consulting Services, Inc.**
P.O. Box 1478
Pelham , AL 35124

Project: Air Force Academy Hospital

CEI Lab Code: A03-0492
Received: 01-22-03
Analyzed: 01-23-03
Reported: 01-23-03
Analyst: Scott Minyard

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A82	A112681A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112681B	MASTIC (TYPE 2) Heterogeneous, Tan, Fibrous, Bound MAST 92 % CELL 5 % SYNT 3 %	ND
A83	A112682A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112682B	MASTIC (TYPE 2) Heterogeneous, Tan, Fibrous, Bound MAST 92 % CELL 5 % SYNT 3 %	ND
A84	A112683A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112683B	MASTIC (TYPE 2) Heterogeneous, Yellow, Fibrous, Bound MAST 95 % CELL 5 %	ND

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A03-0492

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A85	A112684A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112684B	MASTIC (TYPE 2) Heterogeneous, Tan, Fibrous, Bound MAST 95 % CELL 5 %	ND
A86	A112685A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112685B	MASTIC (TYPE 2) Heterogeneous, Tan, Fibrous, Bound MAST 95 % CELL 5 %	ND
A87	A112686A	MASTIC (TYPE 1) Heterogeneous, Black, Fibrous, Bound CHRY 5 % MAST 95 % CELL <1 %	CHRY 5 %
	A112686B	MASTIC (TYPE 2) Heterogeneous, Tan, Fibrous, Bound MAST 95 % CELL 5 %	ND
A88	A112687	FLOOR TILE ONLY Heterogeneous, Off-white, Non-fibrous, Tightly Bound VINYL 97 % CELL <1 % MICA 3 %	ND
A89	A112688	SINK COATING Heterogeneous, Beige, Fibrous, Loosely Bound BIND 80 % CELL 10 % MICA 10 %	ND

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A03-0492

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A90	A112689	CEILING TILE Heterogeneous, Grey, Off-white, Fibrous, Bound BIND 10 % CELL 35 % PAINT 5 % FBGL 25 % PERL 25 %	ND
A91	A112690	SINK COATING Heterogeneous, Grey, Fibrous, Bound CHRY 10 % BIND 90 % CELL <1 %	CHRY 10%
A92	A112691	CEILING TILE Heterogeneous, Grey, Off-white, Fibrous, Bound BIND 15 % CELL 35 % PERL 25 % FBGL 25 %	ND
A93	A112692	JOINT COMPOUND Heterogeneous, Beige, Fibrous, Bound CHRY 5 % BIND 92 % CELL <1 % MICA 3 %	CHRY 5 %
A94	A112693	FLOOR TILE ONLY Heterogeneous, Beige, Blue, Non-fibrous, Tightly Bound VINYL 97 % CELL <1 % MICA 3 %	ND
A95	A112694	SINK COATING Heterogeneous, Black, Fibrous, Bound CHRY 5 % BIND 95 % CELL <1 %	CHRY 5 %
A96	A112695	WALL BASE ADHESIVE Heterogeneous, Brown, Fibrous, Bound TREM 2 % MAST 90 % CELL 3 % TALC 3 % NTREM 2 %	TREM 2 %
A97	A112696	MASTICS Heterogeneous, Black, Tan, Fibrous, Bound CHRY 3 % MAST 92 % CELL 5 %	CHRY 3 %

Unable to saparate mastics for analysis.

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A03-0492

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION						% ASBESTOS
A98	A112697	CEILING TILE						ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound						
			BIND	10 %	CELL	35 %		
			PAINT	5 %	FBGL	25 %		
			PERL	25 %				
A99	A112698	CEILING TILE						ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound						
			BIND	10 %	CELL	35 %		
			PAINT	5 %	FBGL	25 %		
			PERL	25 %				
A100	A112699	SINK COATING						CHRY 5 %
	Heterogeneous,	Black, Fibrous, Bound						
		CHRY 5 %	BIND	95 %	CELL	<1 %		
A101	A112700A	FLOOR TILE						ND
	Heterogeneous,	Grey, Off-white, Non-fibrous, Tightly Bound						
			VINYL	97 %	CELL	<1 %		
			MICA	3 %				
	A112700B	MASTIC						ND
	Heterogeneous,	Yellow, Fibrous, Bound						
			MAST	97 %	CELL	3 %		
A102	A112701	CEILING TILE						ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound						
			BIND	10 %	CELL	35 %		
			PAINT	5 %	FBGL	25 %		
			PERL	25 %				
A103	A112702	CEILING TILE						ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound						
			BIND	10 %	CELL	35 %		
			PAINT	5 %	FBGL	25 %		
			PERL	25 %				
A104	A112703	JOINT COMPOUND						ND
	Heterogeneous,	Off-white, Non-fibrous, Bound						
			BIND	80 %	CELL	<1 %		
			PAINT	10 %				
			MICA	10 %				

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A03-0492

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION				% ASBESTOS
A105	A112704	JOINT COMPOUND				ND
	Heterogeneous,	Off-white, Non-fibrous, Bound				
		BIND	80 %	CELL	<1 %	
		PAINT	10 %			
		MICA	10 %			
A106	A112705	CEILING TILE				ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound				
		BIND	15 %	CELL	35 %	
		PERL	25 %	FBGL	25 %	
A107	A112706	CEILING TILE				ND
	Heterogeneous,	Grey, Off-white, Fibrous, Bound				
		BIND	10 %	CELL	35 %	
		PERL	25 %	FBGL	25 %	
		PAINT	5 %			
A108	A112707	JOINT COMPOUND				ND
	Heterogeneous,	Off-white, Non-fibrous, Bound				
		BIND	80 %	CELL	<1 %	
		PAINT	10 %			
		MICA	10 %			
A109	A112708	PLASTER				ND
	Heterogeneous,	Grey, Beige, Non-fibrous, Bound				
		PLAS	100 %	CELL	<1 %	
A110	A112709	INSULATION SEALANT (BEIGE)				ND
	Heterogeneous,	Beige, Non-fibrous, Bound				
		MAST	95 %	CELL	5 %	
A111	A112710	CEILING TREATMENT				CHRY 10%
	Heterogeneous,	Grey, Fibrous, Loosely Bound				
		CHRY 10 %	BIND	55 %	CELL	<1 %
			PAINT	10 %		
			PERL	25 %		
A112	A112711	CEILING TREATMENT				CHRY 10%
	Heterogeneous,	Grey, Fibrous, Loosely Bound				
		CHRY 10 %	BIND	55 %	CELL	<1 %
			PAINT	10 %		
			PERL	25 %		

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: : 919-481-1442

Project: Air Force Academy Hospital

Lab Code: A03-0492

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION					% ASBESTOS
A113	A112712	CEILING TREATMENT					CHRY 10%
	Heterogeneous,	Grey, Fibrous, Loosely Bound					
		CHRY 10 %	BIND	55 %	CELL	<1 %	
			PAINT	10 %			
			PERL	25 %			
A114	A112713A	FLOOR TILE					ND
	Heterogeneous,	Grey, Non-fibrous, Tightly Bound					
			VINYL	97 %	CELL	<1 %	
			MICA	3 %			
	A112713B	MASTIC					ND
	Heterogeneous,	Tan, Clear, Fibrous, Bound					
			MAST	97 %	CELL	3 %	

The following definitions apply to the abbreviations used in the ASBESTOS BULK ANALYSIS REPORT:

CHRY = Chrysotile	CELL = Cellulose	DEBR = Debris
AMOS = Amosite	FBGL = Fibrous Glass	BIND = Binder
CROC = Crocidolite	ORGN = Organics	SILI = Silicates
TREM = Tremolite	SYNT = Synthetics	GRAV = Gravel
ANTH = Anthophyllite	WOLL = Wollastonite	MAST = Mastic
ACTN = Actinolite	CERWL = Ceramic Wool	PLAS = Plaster
ND = None Detected	NTREM = Non-Asbestiform Tremolite	PERL = Perlite
NANTH = Non-Asbestiform Anthophyllite		RUBR = Rubber

CLIENT: Shelby Consulting Services, Inc.

PROJECT: Air Force Academy Hospital
CEI LAB CODE: A03-0492

Stereoscopic microscopy and polarized light microscopy coupled with dispersion staining is the analytical technique used for sample identification. The percentage of each component is visually estimated by volume. These results pertain only to the samples analyzed. The samples were analyzed as submitted by the client and may not be representative of the larger material in question. Unless notified in writing to return samples, Carolina Environmental, Inc. will discard all bulk samples after 30 days.

Many vinyl floor tiles have been manufactured using greater than 1% asbestos. Often the asbestos was milled to a fiber size below the detection limit of polarized light microscopy. Therefore, a "None Detected" (ND) reading on vinyl floor tile does not necessarily exclude the presence of asbestos. Transmission electron microscopy provides a more conclusive form of analysis for vinyl floor tiles.

It is certified by the signature below that Carolina Environmental, Inc. is accredited by the National Voluntary Accreditation Program (NVLAP) for the analysis of asbestos in bulk materials. The accredited test method is EPA / 600 / M4-82 / 020 for the analysis of asbestos in building materials. Procedures described in EPA / 600 / R-93 / 116 have been incorporated where applicable. The detection limit for the method is 0.1% (trace amount). Carolina Environmental, Inc.'s NVLAP accreditation number is #101768-0. This report is not to be used to claim product endorsement by NVLAP or any agency of the U. S. Government. This report and its contents are only valid when reproduced in full. Dust and soil analyses for asbestos using PLM are not covered under NVLAP accreditation.

ANALYST _____

REVIEWED BY _____
Tianbao Bai, Ph.D.
Laboratory Director

End of Report

a03-0492

a112681 - a112713

(33)

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Tel: 919-481-1413; Fax: 919-481-1442

CHAIN OF CUSTODY RECORD
CLIENT ANALYSIS REQUEST

CLIENT: Shelby Consulting Svcs. Inc.	PROJECT MANAGER: N. Glenn Ray
ADDRESS: P.O. Box 1478	PHONE: 205-664-1313
Pelham AL 35124	FAX: 205-664-1417

PROJECT DESCRIPTION	PROJECT CODE	ASBESTOS: PLM Bulk	ASBESTOS: PLM Point Count	ASBESTOS: PLM Gravimetric	ASBESTOS: PCM Air	ASBESTOS: TEM Bulk	ASBESTOS: TEM Air	LEAD: Lead Paint	LEAD: Lead Wipe	LEAD: Lead Soil	LEAD: Lead Air	Other Analysis
Air Force Academy Hosp.		X										
Samples A82-A114												

TURN-AROUND TIME

- [X] 3 - 5 DAY
- [ ] 48 HOUR
- [ ] 24 HOUR
- [ ] 4 HOUR

CLIENT ID#

2403

Samples will be disposed of 30 days after analysis, unless otherwise requested.

REMARKS:

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
N. Glenn Ray	Jan 20, 03	Jay Logan	1/22/03 4:50
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:

SAMPLE ANALYSIS REQUEST FORM

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL 35124

PROJECT NAME: Air Force Academy Hospital

PROJECT LOCATION: Colorado Springs, Colorado

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION	RESULT
PLM	A82	Floor mastic A1121081	
"	A83	" " 82	
	A84	" " 83	
	A85	" " 84	
	A86	" " 85	
	A87	" " 86	
	A88	Floor tile 87	
	A89	sink coating 88	
	A90	ceiling tile 89	
	A91	sink coating 90	
	A92	ceiling tile 91	
	A93	drywall joint compound 92	
	A94	floor tile 93	
	A95	sink coating 94	
	A96	wall base adhesive 95	
	A97	floor adhesive 96	
	A98	ceiling tile 97	
	A99	ceiling tile 98	
	A100	sink coating 99	
	A101	floor tile 100	
	A102	ceiling tile 01	
	A103	ceiling tile 02	
	A104	drywall joint compound 03	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR 48 HOUR (72 HOUR) 5 DAY

CHAIN OF CUSTODY

SAMPLED BY:	RECEIVED BY:	TRANSPORTED BY:	LAB CUSTODY:
N. Glenn Ray	N. Glenn Ray	Federal Express	Joy Logan
SIGNED:	SIGNED:	SIGN:	SIGN: Joy Logan
DATE: Jan 17, 2003	DATE: Jan 17-20, 03	DATE: Jan 20-21, 03	DATE: 1/22/03

SAMPLE ANALYSIS REQUEST FORM

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL 35124

PROJECT NAME: Air Force Academy Hospital

PROJECT LOCATION: Colorado Springs, Colorado

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION		RESULT
PLM	A105	drywall joint compound	011270 4	
	A106	ceiling tile	05	
	A107	ceiling tile	06	
	A108	drywall joint compound	07	
	A109	wall plaster	08	
	A110	insulation sealant (beige)	09	
	A111	ceiling treatment	10	
	A112	" "	11	
	A113	" "	12	
	A114	floor tile	13	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR 48 HOUR (72 HOUR) 5 DAY

CHAIN OF CUSTODY

SAMPLED BY:	RECEIVED BY:	TRANSPORTED BY:	LAB CUSTODY:
N. Glenn Ray	N. Clark	Fed Express	
SIGNED:	SIGNED:	SIGN:	SIGN:
DATE: 1/17/03	DATE: 1/17-20/3	DATE: 1/20-21/03	DATE:

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: (919) 481-1413 Fax: (919) 481-1442

LABORATORY REPORT
ASBESTOS BULK ANALYSIS

Client: **Shelby Consulting Services, Inc.**
P.O. Box 1478
Pelham , AL 35124

Project: Air Force Academy Medical Center

CEI Lab Code: A03-5262
Received: 07-08-03
Analyzed: 07-09-03
Reported: 07-09-03
Analyst: Gary A. Swanson

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A115	A166203	WALL BASE ADHESIVES	ND
	Homogeneous,	Brown, Beige, Fibrous, Bound	
		BIND 97 % CELL 3 %	
A116	A166204	WALL BASE ADHESIVES	ND
	Homogeneous,	Brown, Beige, Fibrous, Bound	
		BIND 97 % CELL 3 %	
A117	A166205	DRYWALL JOINT COMPOUNDS	CHRY 3%
	Homogeneous,	Beige, Fibrous, Bound	
		CHRY 3 % BIND 97 %	
A118	A166206	DRYWALL JOINT COMPOUND	CHRY 3%
	Homogeneous,	Beige, Fibrous, Bound	
		CHRY 3 % BIND 97 %	
A119	A166207	WALL BASE ADHESIVE	TREM <1%
	Homogeneous,	Brown, Fibrous, Bound	
		TREM <1 % BIND 97 % TALC 2 %	
A120	A166208	WALL BASE ADHESIVE	TREM <1%
	Homogeneous,	Brown, Fibrous, Bound	
		TREM <1 % BIND 97 % TALC 2 %	

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Medical Center

Lab Code: A03-5262

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A121	A166209	DRYWALL JOINT COMPOUND	**CHRY 3%**
	Homogeneous,	Beige, Fibrous, Bound	
		CHRY 3 % BIND 97 %	
A122	A166210	WALL BASE ADHESIVE	**TREM <1%**
	Homogeneous,	Brown, Fibrous, Bound	
		TREM <1 % BIND 97 % TALC 2 %	
A123	A166211	DRYWALL JOINT COMPOUND	**ND**
	Homogeneous,	Beige, Non-fibrous, Bound	
		BIND 100 %	
A124	A166212	DRYWALL JOINT COMPOUND	**CHRY 3%**
	Homogeneous,	Beige, Fibrous, Bound	
		CHRY 3 % BIND 97 %	
A125	A166213	DRYWALL JOINT COMPOUND	**CHRY 3%**
	Homogeneous,	Beige, Fibrous, Bound	
		CHRY 3 % BIND 97 %	
A126	A166214	WALL BASE ADHESIVE	**ND**
	Homogeneous,	Brown, Non-fibrous, Bound	
		BIND 100 %	
A127	A166215	WALL BASE ADHESIVE	**ND**
	Homogeneous,	Brown, Non-fibrous, Bound	
		BIND 100 %	
A128	A166216	WALL INSULATION	**CHRY 40%**
	Homogeneous,	White, Fibrous, Loosely Bound	
		CHRY 40 % FBGL 60 %	

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Medical Center

Lab Code: A03-5262

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A129	A166217	WALL BASE ADHESIVE	ND
	Homogeneous,	Brown, Non-fibrous, Bound	
		MAST 100 %	
A130	A166218	DRYWALL JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A131	A166219	CEILING TILE	ND
	Heterogeneous,	White, Grey, Fibrous, Loosely Bound	
		PERL 27 % CELL 35 %	
		PAINT 3 % FBGL 35 %	
A132	A166220	DRYWALL JOINT COMPOUND	ND
	Homogeneous,	White, Non-fibrous, Bound	
		BIND 100 %	
A133	A166221	FIREPROOFING	ND
	Homogeneous,	Grey, Fibrous, Loosely Bound	
		BIND 3 % FBGL 97 %	
A134	A166222	DUCT INSULATION MASTIC	ND
	Heterogeneous,	White, Brown, Fibrous, Bound	
		BIND 40 % FBGL 10 %	
		FOIL 10 % CELL 40 %	
A135	A166223	CARPET ADHESIVE / LEVELING COMPOUND	ND
	Heterogeneous,	White, Yellow, Fibrous, Bound	
		BIND 97 % FBGL 3 %	
A136	A166224	WALL BASE ADHESIVE	ND
	Homogeneous,	Beige, Non-fibrous, Bound	
		BIND 100 %	

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Phone: 919-481-1413 Fax: 919-481-1442

Project: Air Force Academy Medical Center

Lab Code: A03-5262

CLIENT ID	CEI LAB ID	SAMPLE DESCRIPTION	% ASBESTOS
A137	A166225	WALL BASE ADHESIVE	ND
	Homogeneous,	Beige, Brown, Non-fibrous, Bound	
		BIND 100 %	

The following definitions apply to the abbreviations used in the ASBESTOS BULK ANALYSIS REPORT:

CHRY = Chrysotile	CELL = Cellulose	DEBR = Debris
AMOS = Amosite	FBGL = Fibrous Glass	BIND = Binder
CROC = Crocidolite	ORGN = Organics	SILI = Silicates
TREM = Tremolite	SYNT = Synthetics	GRAV = Gravel
ANTH = Anthophyllite	WOLL = Wollastonite	MAST = Mastic
ACTN = Actinolite	CERWL = Ceramic Wool	PLAS = Plaster
N D = None Detected	NTREM = Non-Asbestiform Tremolite	PERL = Perlite
NANTH = Non-Asbestiform Anthophyllite		RUBR =Rubber

CLIENT: Shelby Consulting Services, Inc.

PROJECT: Air Force Academy Medical Center

CEI LAB CODE: A03-5262

Stereoscopic microscopy and polarized light microscopy coupled with dispersion staining is the analytical technique used for sample identification. The percentage of each component is visually estimated by volume. These results pertain only to the samples analyzed. The samples were analyzed as submitted by the client and may not be representative of the larger material in question. Unless notified in writing to return samples, Carolina Environmental, Inc. will discard all bulk samples after 30 days.

Many vinyl floor tiles have been manufactured using greater than 1% asbestos. Often the asbestos was milled to a fiber size below the detection limit of polarized light microscopy. Therefore, a "None Detected" (ND) reading on vinyl floor tile does not necessarily exclude the presence of asbestos. Transmission electron microscopy provides a more conclusive form of analysis for vinyl floor tiles.

It is certified by the signature below that Carolina Environmental, Inc. is accredited by the National Voluntary Accreditation Program (NVLAP) for the analysis of asbestos in bulk materials. The accredited test method is EPA / 600 / M4-82 / 020 for the analysis of asbestos in building materials. Procedures described in EPA / 600 / R-93 / 116 have been incorporated where applicable. The detection limit for the method is 0.1% (trace amount). Carolina Environmental, Inc.'s NVLAP accreditation number is #101768-0. This report is not to be used to claim product endorsement by NVLAP or any agency of the U. S. Government. This report and its contents are only valid when reproduced in full. Dust and soil analyses for asbestos using PLM are not covered under NVLAP accreditation.

ANALYST _____

REVIEWED BY _____

Tianbao Bai, Ph.D.
Laboratory Director

End of Report

A03-5262
A166203-A166225

CHAIN OF CUSTODY RECORD

CLIENT ANALYSIS REQUEST

23

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Tel: 919-481-1413; Fax: 919-481-1442

CLIENT: Shelby Consulting Svcs. Inc.	PROJECT MANAGER: Glenn Ray
ADDRESS: P.O. Box 1478	PHONE: 205-664-1313
Pelham AL 35124	FAX: 205-664-1417

PROJECT DESCRIPTION	PROJECT CODE	ASBESTOS: PLM Bulk	PLM Point Count	PLM Gravimetric	PCM Air	TEM Bulk	TEM Air	LEAD: Lead Paint	Lead Wipe	Lead Soil	Lead Air	Other Analysis
Air Force Academy - Medical Center	23 samples	X										

TURN-AROUND TIME

3DAY
X 3 ~~3DAY~~
☐ 48 HOUR
☐ 24 HOUR
☐ 4 HOUR

CLIENT ID#

Samples will be disposed of 30 days after analysis, unless otherwise requested.

REMARKS:

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
M. Glenn Ray	July 07, 2003	[illegible]	7/8/03 10:15
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:

SAMPLE ANALYSIS REQUEST FORM

AO3-5262

CLIENT NAME: SHELBY CONSULTING SERVICES, INC.
P.O. BOX 1478 PELHAM, AL. 35124

PROJECT NAME: Air Force Academy - Medical Center

PROJECT LOCATION: Colorado Springs, CO

ANALYSIS REQUESTED	SAMPLE NUMBERS	DESCRIPTION	RESULT
PLM	A115	wall base adhesives	
	A116	" " "	
	A117	drywall joint compound	
	A118	" " "	
	A119	wall base adhesive	
	A120	" " "	
	A121	drywall joint compound	
	A122	wall base adhesive	
	A123	drywall joint compound	
	A124	" " "	
	A125	" " "	
	A126	wall base adhesive	
	A127	" " "	
	A128	wall insulation	
	A129	wall base adhesive	
	A130	drywall joint compound	
	A131	ceiling tile	
	A132	drywall joint compound	
	A133	insulation / fireproofing - roof deck	
	A134	duct insulation mastic	
	A135	carpet adhesive & leveling compound	
	A136	wall base adhesive	
	A137	" " "	

TURNAROUND TIME (CIRCLE ONE) SAME DAY 24 HOUR 48 HOUR (72 HOUR) 5 DAY

CHAIN OF CUSTODY

SAMPLED BY: N. Glenn RAY	RECEIVED BY:	TRANSPORTED BY: Fed Ex	LAB CUSTODY:
SIGNED:	SIGNED:	SIGN:	SIGN:
DATE: March 31, 2003	DATE:	DATE: July 07, 03	DATE:

CAROLINA ENVIRONMENTAL, INC.

LABORATORY REPORT

Wall Base Adhesive <1%

PLM GRAVIMETRIC POINT COUNT ANALYSIS

Client Name: Shelby Consulting Services Inc. **Date Sampled:** 7/29/2003

Date Received: 7/29/2003 **Date Reported:** 8/1/2003

CEI Lab Code: A03-5262.1 **Analyzed By:** Gary A. Swanson

Project Site: AIR FORCE ACADEMY

Adhesive Wall Base

CEI Lab ID	Client Sample ID	Sample Weight (g)	% Organic Material	% Acid Soluble Material	% Acid Insoluble Material	Asbestos Type	% Asbestos
A166207	A119	0.2902	52.9	0	46.6	Tremolite	0.47
A166208	A120	0.2041	53.6	2.6	43.5	Tremolite	0.32
A166210	A122	0.2143	52.8	1.4	45.1	Tremolite	0.68

Reviewed By: Tianbao Bai

Tianbao Bai

102-H Commonwealth Court
Cary, NC 27511

Phone: (919) 481-1413
Fax: (919) 481-1442

Gary

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Tel: 919-461-1413; Fax: 919-461-1442

CHAIN OF CUSTODY RECORD
CLIENT ANALYSIS REQUEST

CLIENT: Shelby Consulting Svcs Inc.	PROJECT MANAGER: Glenn Ray
ADDRESS: P.O. Box 1478	PHONE: 205-664-1313
Pelham AL 35124	FAX: 205-664-1417

PROJECT DESCRIPTION	PROJECT CODE (CEI LAB CODE)	ASBESTOS: PLM Bulk	ASBESTOS: PLM Point Count	ASBESTOS: PLM Gravimetric	ASBESTOS: PCM Air	ASBESTOS: TEM Bulk	ASBESTOS: TEM Air	LEAD: Lead Paint	LEAD: Lead Wipe	LEAD: Lead Soil	LEAD: Lead Air	Other Analysis
Air Force Academy												
Sample # A119 A166207	A03-5262		X	X								
A120 A166208	"		X	X								
A122 A166210	"		X	X								

TURN-AROUND TIME
- X 3-5 DAY
- 48 HOUR
- 24 HOUR
- 4 HOUR

CLIENT ID#

Samples will be disposed of 30 days after analysis, unless otherwise requested.

REMARKS: GRAV. Pt Ct per conversation with G. RAY 7/30/03
Please pull the samples listed above from storage & provide point count.

RELINQUISHED BY: G. Glenn Ray	DATE/TIME: 7/29/3	RECEIVED BY:	DATE/TIME:
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:

CEI FORM #200-1 VERSION 2002

NOV-18-03 04:00 PM SHELBY CONSULTING SVCS 2056641417 P.03

CAROLINA ENVIRONMENTAL, INC.

LABORATORY REPORT

PLM GRAVIMETRIC ANALYSIS

Wall Base Adhesive <1%

Client Name: Shelby Consulting Services, **Date Sampled:** 8/2/2003

Date Received: 8/5/2003 **Date Reported:** 8/7/2003

CEI Lab Code: A03-6016 **Analyzed By:** Gregory J. Hanes

Project Site: Air Force Academy

Wall Base Adhesive

CEI Lab ID	Client Sample ID	Sample Weight (g)	% Organic Material	% Acid Soluble Material	% Acid Insoluble Material	Asbestos Type	% Asbestos
A175619	A96	0.2331	52.51	7.89	38.81	Tremolite	0.79

Reviewed By: Tianbao Bai

Tianbao Bai

102-H Commonwealth Court
Cary, NC 27511

Phone: (919) 481-1413
Fax: (919) 481-1442

NOV-18-2003 16:09 2056641417 95% P.05

A03-6016
A/15619 ①

CAROLINA ENVIRONMENTAL, INC.
107 New Edition Court, Cary, NC 27511
Tel: 919-481-1413; Fax: 919-481-1442

CHAIN OF CUSTODY RECORD
ASBESTOS ANALYSIS

* call Glenn Ray at 205-821-7499 if any questions ①

Client: Shelby Consulting Services, Inc.	Project Manager: N. Glenn Ray
Address: P.O. Box 1478	Phone: 205-664-1313 or cell 205-821-7499
Pelham AL 35124	Fax: 205-664-1417
PO # :	

PROJECT DESCRIPTION	PROJECT CODE	ASBESTOS: PLM Bulk	PLM Point Count	PLM Gravimetric	PCM Air	TEM Bulk	TEM Air	LEAD PAINT: Lead Paint	Lead Wipe	Lead Soil	Lead Air	Other Analysis
Air Force Academy				X								
Sample # A96 Brown												
Wall Base Adhesive												
*												

TURN-AROUND TIME
- [X] 3 - 5 DAY
- [ ] 48 HOUR
- [ ] 24 HOUR
- [ ] 4 HOUR

CLIENT ID#

REMARKS: Please do not analyze any joint compound if it present in the sample of wall base adhesive.

Samples will be disposed of 30 days after analysis, unless otherwise requested.

Relinquished By:	Date / Time:	Received By:	Date / Time:
N. Glenn Ray	Aug 2, 2003	[illegible]	8/5/03 10:05
Relinquished By:	Date / Time:	Received By:	Date / Time:

CEI FORM #200-1 VERSION 2003

NOV-18-03 04:00 PM SHELBY CONSULTING SVCS 2056641417 P.05

NOV-18-2003 16:09 703 368 7761 P.01/01
NOV-07-2003 08:13 R J LEE GROUP 96% P.06
NOV-18-03 04:01 PM SHELBY CONSULTING SVCS 2056641417 P.06
TOTAL P.01

RJ Lee Group, Inc.

NVLAP Accreditation No. 101708-3, AIHA Accreditation No. 109811

46503 Buttonwood Parkway · Monessen, PA 15062
Voice 703/368-7680 · Fax 703/368-7761

LABORATORY REPORT

Drywall joint compound
Joint compound 0.75 – 1.25%

Shelby Consulting Services, Inc
P.O. Box 1478
Pelham, Alabama 35124
Attention: Glenn Ray
Telephone: 205 664-1313

Report Date: November 7, 2003
Sample Receipt Date: November 6, 2003
Sample Analysis Date: November 6, 2003
RJ Lee Group Job No.: AOW-311018
Client Job Number: Building 4102
Authorization / P.O. No.: Glenn Ray

Analysis: Asbestos in Bulk Samples
Method: Polarized Light Microscopy / Dispersion Staining (PLM), 40 CFR Part 763, Appendix E To Subpart E, Point Count Protocol

Sample Identification		Physical Description of Sample; Additional Comments	Homogeneous (yes/no)	Number of Layers	Asbestos Detected		Total Asbestos	Notes
RJ Lee Grp	Client:				Chrysotile (area %)	Amphibole (area %)	(area %)	
1024960	A117	tan joint compound	Yes	1	1.25	ND 0.25	1.25	
1024961	A125	tan joint compound	Yes	1	0.75	ND 0.25	0.75	

A = Amosite
AC = Actinolite
AN = Anthophyllite
CR = Crocidolite
TR = Tremolite

CELL = Cellulose
MW = Mineral Wool
FBG = Fiberglass
SYN = Synthetic
WO = Wollastonite
NTR = Non-Asbestiform TR
NAC = Non-Asbestiform AC
FT = Fibrous Talc
AH = Actinol Hbs

Q = Quartz
C = Carbonates
V = Vermiculite
G = Gypsum
H = Hydromags
T = Talc
P = Perlite
O = Organics
B = Binder
OP = Opaques
D = Diatoms
MP = Misc Parts

Russell D. Cox
Laboratory Analyst

Monica M. McCloy
Laboratory Manager

NOV-18-2003 16:09 2056641417 96% P.07

RJ Lee Group, Inc.

Request for Laboratory Analytical Services

Shaded Areas For RJ Lee Gr. Use	Page ____ of ____
Project No.	
Client No.	C003032
Date Logged In	By

Purchase Order No. | Client Job. No. Buildings 4102

Report Results To	
Name	Glenn Ray
Company	Shelby Consulting Services, Inc.
Street Address	P.O. Box 1478
City, State, Zip	Pelham, Alabama 35124
Phone No.	205-664-1313 Fax No. 205-664-1417

Date & Time Results Requested: 24 Hour - Nov. 7 (by 5:00 PM)
(Standard TA assumed if left blank; do not use vague terms like ASAP)

If the invoice is to be sent to an address different than the report, please provide the address on the back and check here: ☐

(complete if applicable) ☐ Drinking Water ? ____ State where collected

#	Client Sample Identification	Date Sampled	Matrix / Media	Area / Volume (specify units)	Number of Containers	Analyses Requested: Asbestos Point County
A117	drywall joint compound		Bulk		1	X
A125	" " "		Bulk		1	X

For Lab Use Only ↓

Chain of Custody	Relinquished by: N. Glenn Ray	Date/Time Nov. 5/03	Received at Lab by:	Date/Time
	Method of Shipment: Federal Express		Sample Condition Upon Receipt: ☐ Acceptable ☐ Other (explain on reverse)	
Prepped by:	Date: Prepped by: Date:		Disposition of Sample(s) Storage:	Date:
Analyzed by:	Date: Analyzed by: Date:		Returned: Date:	Method of Shipment:

Please return completed form to one of the following RJ Lee Group labs:

For special instructions (method, detection limits, preservative, etc.) please note on the back and check here: ☐

10503 Baltimore Parkway	350 Hochberg Road	530 McCormick Place	14760 Memorial Dr., # 106
Manassas, VA 20109	Monroeville, PA 15146	San Leandro, CA 94577	Houston, TX 77079
(703) 368 - 7890 Voice	(412) 325-1776 Voice	(510) 567-0480 Voice	(713) 584-0584 Voice
(703) 368 - 7761 Fax	(412) 733-1799 Fax	(510) 567-0488 Fax	(713) 584-0588 Fax

724

NOV-18-03 04:01 PM SHELBY CONSULTING SVCS 2056641417 P.07

NOV-18-2003 16:09 703 358 7761 P.01
NOV-17-2003 08:15 R J LEE GROUP 2056641417 95% P.08
NOV-18-03 04:02 PM SHELBY CONSULTING SVCS 2056641417 P.08

RJ Lee Group, Inc.

NVLAP Accreditation No. 101208-3, AIHA Accreditation No. 100511

10503 Baileyview Parkway · Manassas, VA 20109
Voice: 703 / 368-7800 Fax: 703 / 368-7761

LABORATORY REPORT

Drywall joint comp. – TEM 3-5%

Shelby Consulting Services, Inc.
P.O. Box 1478
Pelham, Alabama 35124
Attention: Glenn Ray
Telephone: 205-664-8313

Report Date: November 17, 2003
Sample Receipt Date: November 14, 2003
Sample Analysis Date: November 14, 2003
RJ Lee Group Job No.: ACW-311095
Client Job Number: Air Force Academy
Authorization / P.O. No.: Glenn Ray

Analysis: Asbestos in Bulk Samples
Method: Transmission Electron Microscopy (TEM), Semi-Quantitative Adaptation of EPA Level II Method. Fiber ID by Morphology, Energy Dispersive X-Ray Analysis (EDXA), and Selected Area Electron Diffraction (SAED).

Sample Identification		Physical Description of Sample; Additional Comments	Homogeneous (yes/no)	Number of Layers	Asbestos Detected		Non-Asbestos Fibers (area %)	Non-Fibrous Material (area %)	Matrix Material (composition)
RJ Lee Grp	Client				Chrysotile (area %)	Amphibole (area %)			
1025567	A118	off-white joint compound, tan & white paper, white paint	No	3	5	ND1	10 CELL	85	C, B, Q, OP
1025568	A124	white joint compound, white paper, white & tan paint	No	3	3	ND1	15 CELL	82	MP, C, Mica, Q, OP

A = Amosite
AC = Actinolite
AN = Anthophyllite
CR = Crocidolite
TR = Tremolite

CELL = Cellulose
MW = Mineral Wool
FBG = Fiberglass
SYN = Synthetic
WO = Wollastonite
NTR = Non-Asbestiform TR
NAC = Non-Asbestiform AC
FT = Fibrous Talc
AH = Animal Hair

Q = Quartz
C = Carbonates
V = Vermiculite
G = Gypsum
H = Hydrous
T = Tar
P = Perlite
O = Organic
B = Binder
OP = Opaques
D = Diatoms
MP = Misc Parts

Jie Lin
Laboratory Analyst

Morries M. McCloy
Laboratory Manager

APPENDIX 2

DATA TABLE AND REPORTS OF LABORATORY ANALYSIS FOR LEAD IN PAINT

SUMMARY TABLE
BUILDING MATERIALS WITH HOMOGENEOUS PAINTS
AIR FORCE ACADEMY HOSPITAL

PAINT NO. (HP#)	SAMPLE NOS.	DESCRIPTION OF MATERIAL	GENERAL LOCATION OF MATERIAL	LEAD CONTENT	PAINT CONDITION
01	L01	PLASTER CEILING SEE LINE HP4 FOR ORIGINAL PLASTER WALLS	UNDERSIDE OF ROOF DECK ON FOURTH FLOOR AND A FEW SCATTERED FEW ROOMS IN FIRST FLOOR ORIGINAL BUILDING AREA	0.121 %	INTACT
02	L02 L05 L06	METAL DOOR FRAME	THROUGHOUT ORIGINAL BUILDING AREAS	0.025 % - 4.962 %	INTACT
03	L03	GYPSUM BOARD	VARIOUS WALLS & CEILINGS INSTALLED DURING RENOVATION PROJECTS	0.004 %	INTACT
04	L04 L07 L09	PLASTER WALL	SCATTERED THROUGHOUT ORIGINAL BUILDING AREAS - MUCH OF THIS MATERIAL IS NOW COVERED BY NEWER GYPSUM BOARD	0.020 % - 0.080 %	INTACT
05	L08	CONCRETE BLOCK WALL	STAIRWELLS AND OTHER WALLS SUCH BASEMENT AREA IN ORIGINAL BUILDING	0.0122 %	INTACT
06	NA	ALL COATINGS	POST 1978 CONSTRUCTION OF BLOCKS 1U & 1T PHARMACY AND ADJACENT AREA OF MAIN ENTRANCE	< 0.06 %	INTACT
07	NA	ALL COATINGS	POST 1978 CONSTRUCTION OF FAMILY PRACTICE CLINIC - BLOCK 1U	< 0.06 %	INTACT
08	NA	ALL COATINGS	POST 1978 CONSTRUCTION OF MRI AREA AND ASSOCIATED CORRIDOR - BLOCK 1F	< 0.06 %	INTACT
09	NA	ALL COATINGS	POST 1978 CONSTRUCTION OF BUILDING 4106 / 4107 - BLOCK 1V	< 0.06 %	INTACT
10	NA	ALL COATINGS	POST 1978 CONSTRUCTION OF LABORATORY AREA - NORTH SIDE OF BLOCK 1K	< 0.06 %	INTACT

SAFETY ENVIRONMENTAL LABORATORIES, INC.

P.O. BOX 661076 • BIRMINGHAM, ALABAMA 35266-1076 • 205-823-6200 • FAX 205-823-9066

DATE SAMPLED: 06/01/02

DATE RECEIVED: 06/03/02

DATE ANALYZED: 06/05/02

DATE REPORTED: 06/06/02

LAB ID#: 02060239

APPROVED BY:
LAB MANAGER DESIGNEE

Rebecca J Hicks

Rebecca J. Hicks

CLIENT: SHELBY CONSULTING SERVICES, INC.
PELHAM, AL

PROJECT: AIR FORCE ACADEMY

ANALYZED BY: TAMMY CHANDLER
QA/QC BY: DAVE SMITH, CHEMIST

ANALYTE: LEAD (Pb) IN PAINT CHIPS

METHODOLOGY:
DIGESTION: EPA 3050 (MODIFIED)
ANALYSIS: EPA 6010

REPORTING LIMIT: 0.002 mg/SAMPLE

Safety Environmental Laboratories, Inc. is accredited by the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP) Lab ID# 100766.

SAMPLE #	MG OF SAMPLE	MG OF Pb IN SAMPLE	% Pb Wt	SAMPLE LOCATION/DESCRIPTION
L01	64.6	0.0784	0.121	PLASTER CEILING
L02	106.8	0.0264	0.025	METAL DOOR FRAME
L03	136.5	0.0050	0.004	GYPSUM BOARD WALL
L04	203.4	0.0751	0.037	PLASTER WALL
L05	187.7	0.3384	0.180	METAL DOOR FRAME
L06	171.5	8.5098	4.962	METAL DOOR FRAME
L07	187.6	0.1502	0.080	PLASTER WALL

SAFETY ENVIRONMENTAL LABORATORIES, INC.
P.O. BOX 661076 • BIRMINGHAM, AL • 35266-1076
3033 LORNA ROAD • BIRMINGHAM, AL • 35216
PHONE (205) 823-6200 • FAX (205) 823-9066

CHAIN OF CUSTODY FORM

CLIENT: Shelby Consulting Svcs, Inc LOCATION: P.O. Box 1478 Pelham AL 35124

JOB NAME/PURCHASE ORDER NUMBER: Air Force Academy

ANALYSIS REQUESTED: CIRCLE ONE ASBESTOS BULK (PLM) ASBESTOS AIR (PCM) (LEAD (Pb)*) ARSENIC (As) OTHER_____

*IF LEAD, PLEASE SPECIFY: 1) AIR, (2) PAINT, 3) TCLP, 4) DUST WIPES, 5) SOIL, 6) WATER

TURN AROUND TIME REQUESTED: RUSH 24 HOUR (3 DAY) 5 DAY OTHER

SAMPLE #	LAB ID#	SAMPLE DESCRIPTION/LOCATION	CONDITION OF SAMPLE RECEIVED
L01	-020239	plaster ceiling	Good
L02		metal door frame	
L03		gypsum board wall	
L04		plaster wall	
L05		metal door frame	
L06		metal door frame	
L07		plaster wall	↓

SAMPLED BY: [signature] June 01, 02 — SIGNATURE/DATE

SENT BY: [signature] June 03, 02 — SIGNATURE/DATE

REC'D BY: Wendi McDuffy — SIGNATURE/DATE/TIME 6/3/02 9:50

ANALYZED BY: Tammy Crandell 6/5/02 — SIGNATURE/DATE

**NOTE: ALL INFORMATION MUST BE COMPLETED

RJ Lee *Group*, Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (724) 325-1776 Fax (724) 733-1799

LABORATORY REPORT

Shelby Consulting Services, Inc.
P.O. Box 1478
Pelham, AL 35124
Attention: Glenn Ray
205-664-1313 FAX 205-664-1417

Analysis: Lead in Paint
Method: EPA SW846-7420 ---- FLAA

RJ Lee Group Job No.: ACW301530
Samples Received: 22-Jan-03
Report Date: 27-Jan-03
Client Project: Air Force Academy
Purchase Order No.: NA
Sampling Date: 17-Jan-03

Sample Identification		Lead		Minimum Reporting Limit	
Client	RJ Lee Group	Weight Percent	Parts per Million	Weight Percent	Parts per Million
L08 Stair Wall-CMU	0384926	< 0.012	< 120	0.0122	122
L09 Plaster Wall	0384927	< 0.020	< 200	0.0200	200

Reporting Limit Verification Recovery: 92.5 %
Matrix Verification Recovery: 91.9 %

These results have been validated in accordance with the quality control requirements specified in the analytical method reported above.
These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

Chuck Keida, Laboratory Manager ☐
Brandon J. Miller, Assistant Scientist ☐
Ryan B. Walters, Assistant Scientist ☐
Kimberly S. DiNatale, Scientist ☑
Philip Grindle, Supervisor ☐
Melissa Varner, Assistant Scientist ☐
_____ ☐

Please direct inquiries to Client Services.

Authorized Signature _____
Date 1/27/03

AIHA ELLAP #8204
CA ELAP #1970
PA DEP #02-396

RJ Lee Group, Inc.

Request for Laboratory Analytical Services

Shaded Areas For RJ Lee Gr. Use	Page ____ of ____
Project No.	Aw301530
Client No.	CO03032
Date Logged In	By

Purchase Order No. | Client Job. No. Air Force Academy

Date & Time Results Requested 3 DAY
(Standard TA assumed if left blank; do not use vague terms like ASAP)

Report Results To

Name	Glenn Ray
Company	Shelby Consulting Services, Inc.
Street Address	P.O. Box 1478
City, State, Zip	Pelham, Alabama 35124
Phone No.	205-664-1313 Fax No. 205-664-1417

If the invoice is to be sent to an address different than the report, please provide the address on the back and check here: ☐

(complete if applicable) ☐ Drinking Water ? ____ State where collected

Client Sample Identification	Date Sampled	Matrix / Media	Area / Volume (specify units)	Number of Containers	Analyses Requested: Total Lead
L08 Stair wall - SMU	1/17/3	Paint		1	X
L09 plaster wall	"	"		1	X

Analyses Requested (Enter an "X" in the box below to indicate request; Enter a "P" if preservative added.) — For Lab Use Only

0384926

1

0384927

Chain of Custody	Relinquished by:		Date/Time 1/20/3	Received at Lab by:	Date/Time 1/22/03 10:00
	Method of Shipment: Federal Express			Sample Condition Upon Receipt: ☐ Acceptable ☐ Other (explain on reverse)	
Prepped by:	Date:	Prepped by:	Date:	Disposition of Sample(s) Storage:	Date:
Analyzed by:	Date:	Analyzed by:	Date:	Returned: Date:	Method of Shipment:

Please return completed form to one of the following RJ Lee Group labs:

10503 Battleview Parkway, Manassas, VA 20109, (703) 368-7860 Voice, (703) 368-7761 Fax

350 Hochberg Road, Monroeville, PA 15146, (412) 325-1776 Voice, (412) 733-1799 Fax

530 McCormick Place, San Leandro, CA 94577, (510) 567-0480 Voice, (510) 567-0488 Fax

14760 Memorial Dr., #106, Houston, TX 77079, (713) 584-0584 Voice, (713) 584-0588 Fax

For special instructions (method, detection limits, preservative, etc.) please note on the back and check here: ☐

724

01/27/2003 18:06 7247331799 RJ LEE → MANASSAS VA. NO.415 0002

APPENDIX 3

TABLE OF HOMOGENEOUS MATERIALS SUSPECTED TO CONTAIN ASBESTOS

SUMMARY TABLE
MATERIALS SUSPECTED TO CONTAIN ASBESTOS
AIR FORCE ACADEMY HOSPITAL

MATL NO. (HM#)	SAMPLE NOS.	DESCRIPTION OF MATERIAL	GENERAL LOCATION OF MATERIAL	ASBESTOS CONTENT	MATL. COND.
01	A01	ASPHALTIC ROOFING MEMBRANE NOTE! ROOFING IN OTHER AREAS AFFECTED BY THIS PROJECT WERE REMOVED AND REPLACED IN SUMMER OF 2002.	ROOF OF FIRST FLOOR AREA ADJACENT TO FAMILY PRACTICE CLINIC	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
02	A02	1' X 1' ACOUSTICAL CEILING TILES NOTE! THIS MATERIAL NO LONGER PRESENT	GLUED TO WALLS AND CEILING IN COMPUTER SYSTEMS ROOM 1292	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
03	A03 A102	2' X 2' ACOUSTICAL CEILING TILES - GREY WITH RABBET EDGES	NUMEROUS LOCATIONS IN BUILDING	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
04	A04, A08, A10, A15, A16, A24, A28, A35, A56, A57, A123, A130	GYPSUM WALL BOARD AND WHITE JOINT COMPOUND	VARIOUS WALLS & CEILINGS THAT HAVE BEEN ADDED OR ALTERED THROUGHOUT THE BUILDING - THESE MATERIALS HAVE BEEN INSTALLED OVER NON-ACM PLASTER IN THE ORIGINAL BUILDING - ALSO THIS JOINT COMPOUND WHICH IS WHITE HAS BEEN SKIMMED OVER A BEIGE ACM JOINT COMPOUND (HM # 19) IN THE 1968 "L" SHAPED ADDITION	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
05	A05, A07, A13, A17, A26, A33, A109	WALL & CEILING PLASTER APPLIED TO WIRE LATH ATTACHED TO BLACK METAL CHANNEL - POSSIBLY APPLIED DIRECTLY TO UNDERSIDE OF ROOF DECK AT FOURTH FLOOR	THROUGHOUT BUILDING ORIGINALLY BUT HAS BEEN COMPLETELY REMOVED IN SOME LOCATIONS AND COVERED BY GYPSUM BOARD IN SOME LOCATIONS	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
06	A06	BROWN ADHESIVE NOTE! THIS MATERIAL IS NO LONGER PRESENT	USED TO ADHERE HM # 02 TILES TO PLASTER	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
07	A09, A19, A22	2' X 2' ACOUSTICAL CEILING TILES - GREY WITH RABBET EDGES AND RAISE SQUARE PANELS	SCATTERED THROUGHOUT BUILDING INCLUDING FOURTH FLOOR CORRIDOR	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD

SUMMARY TABLE
MATERIALS SUSPECTED TO CONTAIN ASBESTOS
AIR FORCE ACADEMY HOSPITAL

08	A11 A60	SPRAY APPLIED BEIGE FIREPROOFING / INSULATION (RELATIVELY DENSE) FORMERLY APPLIED TO UNDERSIDE OF FIRST FLOOR ROOF DECK	SAMPLED AS DEBRIS ATOP WALLS - ALSO INSIDE MANY FIRST FLOOR WALL CAVITIES DUE TO FALLOUT	3 - 15% CHRYSOTILE	FRIABLE POOR
09	A12	SPRAY APPLIED GREY INSULATION (VERY LIGHT)	APPLIED TO INSIDE FACE OF EXTERIOR CONCRETE WALL - CURRENTLY CONCEALED BY INTERIOR WALL FURRING	10% CHRYSOTILE	FRIABLE POOR
10	A14, A65, A78A	WHITE INSULATION MASTIC APPLIED FIBERGLASS MECHANICAL SYSTEM INSULATIONS	ASSOCIATED WITH FIRST FLOOR RENOVATION PROJECTS	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
11	A18, A30, A38	WELDED SEAM SHEET VINYL, ASSOCIATED ADHESIVE, AND OLD BLACK FLOORING MASTIC	SCATTERED THROUGHOUT BUILDING WHERE VINYL ASBESTOS FLOOR TILES WERE ORIGINALLY INSTALLED	NONE IN VINYL OR ASSOCIATED ADHESIVE BUT 5 - 10% CHRYSOTILE IN OLD BLACK MASTIC - SEE NOTE 2	NON-FRIABLE GOOD
12	A23, A103	2' X 2' ACOUSTICAL CEILING TILES WITH PERFORATED WHITE VINYL / PLASTIC FACE	THIRD & FOURTH FLOOR FORMER PATIENT ROOMS AND OFFICES	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
13	A20, A21, A25	WHITE MASTIC APPLIED FIBERGLASS INSULATION	DOMESTIC & HEATING WATER PIPES ABOVE CEILINGS ON THIRD & FOURTH FLOORS	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
14	A96, A115, A116, A119, A120, A122	BROWN WALL BASE ADHESIVE	MIXED WITH NEWER ADHESIVES THROUGHOUT 1968-1970 "L" SHAPED ADDITION	INITIALLY 0 - 2% TREMOLITE BY STANDARD PLM FINAL DETERMINATION BY GRAVIMETRIC POINT COUNTING WAS LESS THAN 1% - THEREFORE NOT ACM	NON-ACM NON-FRIABLE GOOD
15	A27, A110	BEIGE MASTIC APPLIED FIBERGLASS INSULATION	ABOVE CEILING HORIZONTAL SECTIONS OF ORIGINAL ROOF DRAIN PIPES AS ROUTED THROUGHOUT BUILDING	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
16	A29, A32, A34, A36, A82, A83, A84, A85, A86, A87	YELLOW CARPET ADHESIVE AND OLD BLACK FLOORING MASTIC	SCATTERED THROUGHOUT ORIGINAL BUILDING WHERE VINYL ASBESTOS FLOOR TILES WERE ORIGINALLY INSTALLED	NONE IN CARPET ADHESIVE BUT 3 - 10% CHRYSOTILE IN OLD BLACK MASTIC - SEE NOTE 2	NON-FRIABLE GOOD

SUMMARY TABLE
MATERIALS SUSPECTED TO CONTAIN ASBESTOS
AIR FORCE ACADEMY HOSPITAL

17	A31, A126, A127, A129, A137	BROWN WALL BASE ADHESIVE	MIXED WITH NEWER ADHESIVES THROUGHOUT ORIGINAL BUILDING	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
18	A37, A39, A41, A76, A77, A88, A94, A101	1' X 1' VINYL FLOOR TILE ADHERED BY YELLOW ADHESIVE	USED IN VARIOUS MINOR SCATTERED RENOVATIONS INCLUDING ROOMS 1235, 1079, 1089, 1201, 1195, 1144, 1345, 1385	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
19	A93, A117, A118, A121, A124, A125	BEIGE DRYWALL JOINT COMPOUND APPLIED TO CORNERS, SEAMS, EDGES & OVER FASTENERS IN GYPSUM BOARD WALLS	MOST WALLS AND SOME SCATTERED CEILINGS THROUGHOUT THE "L" 1968 ADDITION - NOTE THAT THIS BEIGE ACM COMPOUND HAS BEEN PARTIALLY SKIMMED OVER BY A NEWER NON-ACM WHITE COMPOUND IN SOME AREAS	3 - 5 % CHRYSOTILE	NON-FRIABLE (ONLY WHEN INTACT) GOOD
20	A40, A59	1' X 1' VINYL FLOOR TILE (LIGHT BLUE), ASSOCIATED YELLOW ADHESIVE, AND OLD BLACK MASTIC	BOTTOM LAYER IN ROOMS 1079 AND 1089 - INSTALLED OVER OLD BLACK MASTIC	NONE IN VFT AND ASSOCIATED ADHESIVE BUT 5% CHRYSOTILE IN OLD BLACK MASTIC - SEE NOTE 2	NON-FRIABLE GOOD
21	A100	BLACK COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK THAT IS MOLDED INTO A STAINLESS STEEL COUNTER TOP	ROOM 1385	5 % CHRYSOTILE	NON-FRIABLE GOOD
22	A42, A43, A44	WHITE MASTIC APPLIED TO FIBERGLASS HVAC DUCT & PIPE INSULATIONS	MAIN MECHANICAL ROOM IN BASEMENT	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
23	A104, A105, A108	DRYWALL JOINT COMPOUND APPLIED TO GYPSUM WALL BOARD SEAMS, EDGES, CORNERS & FASTENERS	CORRIDOR LEADING TO MRI BUILDING AND AROUND INSIDE OF WINDOWS IN ADJACENT ROOMS IN BLOCK 1G	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE (ONLY WHEN INTACT) GOOD
24	A106, A107	2' X 4' CEILING TILE	CORRIDOR LEADING TO MRI BUILDING	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
25	A45, A79, A80, A81	WHITE MASTIC APPLIED TO FIBERGLASS INSULATION ON HVAC PIPES, AND DOMESTIC WATER PIPES, & ROOF DRAIN PIPES	ABOVE CEILING IN FIRST FLOOR "L" SHAPED 1968 ADDITION	5 - 10 % CHRYSOTILE	NON-FRIABLE GOOD
26	A46, A47, A48, A58, 97	YELLOW CARPET ADHESIVE AND OLD BLACK FLOORING MASTIC	SCATTERED THROUGHOUT FIRST FLOOR "L" SHAPED ADDITION WHERE VINYL ASBESTOS FLOOR TILES WERE ORIGINALLY INSTALLED	NONE IN CARPET ADHESIVE BUT 3 - 5 % CHRYSOTILE IN OLD BLACK MASTIC - SEE NOTE 2	NON-FRIABLE GOOD

SUMMARY TABLE
MATERIALS SUSPECTED TO CONTAIN ASBESTOS
AIR FORCE ACADEMY HOSPITAL

27	A49, A78B	WHITE MASTIC APPLIED TO FIBERGLASS INSULATION ON HVAC DUCTS	ABOVE CEILING IN FIRST FLOOR "L" SHAPED 1968 ADDITION	5 - 10 % CHRYSOTILE	NON-FRIABLE GOOD
28	A50, A54	2' X 2' ACOUSTICAL CEILING TILE	MRI AREA	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
29	A51, A55	DRYWALL JOINT COMPOUND	WALLS AND ROOF DECK / CEILING IN MODULAR PART OF MRI AREA BLOCK 1F	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
30	A52, A53	1' X 1' VINYL FLOOR TILE (WHITE WITH GREY STREAKS) AND YELLOW ADHESIVE	MRI AREA	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
31	NOT USED				
32	A61	BLACK COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINKS SET IN BEIGE/LIGHT GREY METAL COUNTERS WITH GREY FORMICA TOP	ROOMS ALONG CORRIDOR 1040 IN BLOCK 1P	3% CHRYSOTILE	NON-FRIABLE GOOD
33	A62 A63 A64	BLACK COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINKS SET IN BEIGE METAL COUNTERS WITH BLUE FORMICA TOP	VARIOUS FIRST FLOOR AREAS - MOSTLY BLOCK 1P SOUTH OF ROOMS ALONG CORRIDOR 1040	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
34	A111, A112, A113	WHITE SPRAY APPLIED CEILING TEXTURE	ROOM 1389	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
35	A66	CEILING TILE	THROUGHOUT MODULAR SECTIONS OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
36	A67	GYPSUM WALL BOARD (NO JOINT COMPOUND)	THROUGHOUT MODULAR SECTIONS OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
37	A68	VINYL FLOOR TILE	THROUGHOUT NON-MODULAR SECTION OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
38	A69	COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK	NON-MODULAR SECTION OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
39	A70	CEILING TILE	NON-MODULAR SECTION OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
40	A71	DRYWALL JOINT COMPOUND	APPLIED TO GYPSUM WALL BOARDS IN NON-MODULAR SECTION OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
41	A72	VINYL FLOOR TILE	ROOM 136 IN BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
42	A73	COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK	ROOM 122 OF BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
43	A74	VINYL FLOOR TILE	MAIN ENTRY VESTIBULE AT BUILDING 4106/4107	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD

SUMMARY TABLE
MATERIALS SUSPECTED TO CONTAIN ASBESTOS
AIR FORCE ACADEMY HOSPITAL

44	A75	ROOF CEMENT	APPLIED TO FLASHING AT PARAPETS AND EXPANSION JOINTS ON ROOF OF MODULAR SECTIONS OF BUILDING 4106/4107	5% CHRYSOTILE	NON-FRIABLE GOOD
45	A89	WHITE COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK SET IN BEIGE CABINET WITH BEIGE TOP	ROOM 1342 - BLOCK1R	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE GOOD
46	A90, A98	2' x 4' CEILING TILE WITH TWO SIZES OF PERFORATIONS	MOST ROOMS IN BLOCK 1R	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
47	A91	GREY COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK SET IN BEIGE CABINET WITH GREY TOP	ROOM 1349 - BLOCK 1R	10 % CHRYSOTILE	NON-FRIABLE GOOD
48	A92, A99	2' x 2' CEILING TILE	CORRIDORS AND WAITING AREA IN BLOCK 1R	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
49	A95	BLACK COATING APPLIED TO UNDERSIDE OF STAINLESS STEEL SINK SET IN BEIGE CABINET WITH GREY TOP	ROOM 1352 - BLOCK 1R	5 % CHRYSOTILE	NON-FRIABLE GOOD
50	A131	GREY 2' X 2' LAY IN CEILING TILE WITH RABBET EDGES (SEE NOTE 4)	LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE GOOD
51	A132	DRYWALL JOINT COMPOUND (SEE NOTE 4)	LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE (WHEN INTACT) GOOD
52	A133	ROOF INSULATION (SEE NOTE 4)	UNDERSIDE OF DECK ABOVE CEILING IN LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	FRIABLE FAIR
53	A134	WHITE MASTIC APPLIED TO FIBERGLASS HVAC DUCT INSULATION (SEE NOTE 4)	ABOVE CEILING IN LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE FAIR
54	A135	CARPET ADHESIVE AND FLOOR LEVELING COMPOUND (SEE NOTE 4)	LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE FAIR
55	A136	BEIGE WALL BASE ADHESIVE (SEE NOTE 4)	LATE 1980'S AREA BETWEEN PHARMACY & FAMILY PRACTICE	NONE DETECTED BY STANDARD PLM METHOD	NON-FRIABLE FAIR

Notes:

1) Samples 1 - 17 were collected in 1997, as part of the Family Practice Clinic addition project, and some of the materials they represent have been partially removed - at least from the immediate area of alteration around the Family Practice Clinic addition.

1) The old black ACM mastic associated with the previously removed vinyl asbestos floor tiles partially dislodges from the floor when the newer vinyl tiles, sheet vinyl, and carpets are removed due to the stronger bonding capacity of the newer

adhesive associated with the vinyl tiles, sheet vinyls, and carpets. As such removal of the non-ACM carpets and non-ACM vinyl flooring products will generate ACM waste.

1) The area block designations (e.g. Block 1R) discussed in this summary table directly correspond to the block designations depicted on the project drawings prepared by SS&A, Inc.

1) Materials in the areas constructed in the 1980s and 1990s were not actually suspected to contain asbestos but were sampled in a limited manner in order to document that the spaces had been inspected and to provide analytical quality assurance.

APPENDIX 4

DATA TABLE AND REPORTS OF LABORATORY ANALYSIS FOR LEAD IN DUST AND SOIL

DUST WIPE & SOIL SAMPLE SUMMARY TABLE

SAMPLE NO.	SAMPLE TYPE	SAMPLE LOCATION	LEAD IN SAMPLE	EPA & HUD LEAD THRESHOLD	PASS / FAIL
S1	SOIL	BUILDING PERIMETER	< 42 PPM	1200 PPM	PASS
W1	WIPE	TOP OF LIGHT FIXTURE ABOVE CEILING IN BASEMENT EMPLOYEE BREAKROOM	< 10 UG/SF	400 UG/SF	PASS
W2	WIPE	TOP OF CABINET IN BASEMENT EMPLOYEE BREAKROOM	12.5 UG/SF	250 UG/SF	PASS
W3	WIPE	FLOOR IN BASEMENT EMPLOYEE BREAKROOM	< 10 UG/SF	40 UG/SF	PASS
W4	WIPE	TOP OF CEILING TILE IN FOURTH FLOOR CORRIDOR BETWEEN ROOMS 4021 & 4083	< 10 UG/SF	400 UG/SF	PASS
W5	WIPE	TOP OF LIGHT FIXTURE ABOVE CEILING IN FOURTH FLOOR CORRIDOR BETWEEN ROOMS 4009 & 4076	85 UG/SF	400 UG/SF	PASS
W6	WIPE	TOP OF CEILING TILE IN THIRD FLOOR CORRIDOR NEAR FREIGHT ELEVATOR	21 UG/SF	400 UG/SF	PASS
W7	WIPE	TOP OF LIGHT FIXTURE ABOVE CEILING IN THIRD FLOOR CORRIDOR NORTH OF PASSENGER ELEVATORS	119 UG/SF	400 UG/SF	PASS
W8	WIPE	TOP OF LIGHT FIXTURE ABOVE CEILING IN FIRST FLOOR CORRIDOR BETWEEN ROOMS 1394F & 1395A	31 UG/SF	400 UG/SF	PASS
W9	WIPE	TOP OF GYPSUM BOARD CEILING IN FIRST FLOOR CORRIDOR BETWEEN ROOMS 1400 & 1402	< 10 UG/SF	400 UG/SF	PASS
W10	WIPE	TOP OF HVAC DUCT ABOVE CEILING IN FIRST FLOOR ROOM 1035	112 UG/SF	400 UG/SF	PASS
W11	WIPE	TOP OF LIGHT FIXTURE ABOVE CEILING IN FIRST FLOOR ROOM 1072	19 UG/SF	400 UG/SF	PASS
W12	WIPE	TOP OF HVAC DUCT ABOVE CEILING IN FIRST FLOOR CORRIDOR BETWEEN ROOMS 1269 & 1272	66 UG/SF	400 UG/SF	PASS
W13	WIPE	TOP OF CEILING TILE IN FIRST FLOOR ROOM 1250	31 UG/SF	400 UG/SF	PASS

RJ Lee *Group* , Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (724) 325-1776 Fax (724) 733-1799

LABORATORY REPORT

Table II

Shelby Consulting Services, Inc.
P.O. Box 1478
Pelham, AL 35124
Attention: Glenn Ray
205-664-1313 FAX: 205-664-1417

RJ Lee Group Job No. ACW304520
Samples Received: 8-Apr-03
Report Date: 10-Apr-03
Client Project: Air Force Academy
Purchase Order No.: NA
Sampling Date: 1-Apr-03

Analysis: Lead in Wipe Samples
Method: EPA SW846-7420 ---- FLAA

Minimum Reporting Limit: 10.0 Total µg
Reporting Limit Spike Recovery: 105%
Matrix Spike Recovery: 101% / 90%

Sample Identification		Area Sampled	Lead		
Client	RJ Lee Group	(Sq. Inches)	Total Micrograms	Micrograms Per Sq. Foot	Notes
W1	0392967	144	< 10	< 10	A one square foot area was assumed
W2	0392968	144	12.5	12.5	
W3	0392969	144	< 10	< 10	
W4	0392970	144	< 10	< 10	
W5	0392971	144	85.0	85.0	
W6	0392972	144	21.3	21.3	
W7	0392973	144	119	119	
W8	0392974	144	30.5	30.5	
W9	0392975	144	< 10	< 10	
W10	0392976	144	112	112	
W11	0392977	144	18.5	18.5	
W12	0392978	144	66.3	66.3	
W13	0392979	144	< 10	< 10	

These results have been validated in accordance with the quality control requirements specified in the analytical method reported above.
These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

Chuck Keida, Laboratory Manager ☐
Brandon J. Miller, Assistant Scientist ☐
Ryan B. Walters, Assistant Scientist ☐
Kimberly S. DiNatale, Scientist ☑
Philip Grindle, Supervisor ☐
Melissa Varner, Assistant Scientist ☐
_____ ☐

Please direct inquiries to Client Services.

Auth. Signature
Date 4/11/03

RJ Lee *Group*, Inc.

350 Hochberg Road Monroeville, PA 15146
Phone (724) 325-1776 Fax (724) 733-1799

LABORATORY REPORT

Table I

Shelby Consulting Services, Inc.
P.O. Box 1478
Pelham, AL 35124
Attention: Glenn Ray
205-664-1313 FAX: 205-664-1417

Analysis: Lead in Soil
Method: EPA SW846-7420 ---- FLAA

RJ Lee Group Job No.: ACW304520
Samples Received: 8-Apr-03
Report Date: 10-Apr-03
Client Project: Air Force Academy
Purchase Order No.: NA
Sampling Date: 1-Apr-03

Reporting Limit Spike Recovery: 93%
Martix Spike Recovery: 77%

Sample Identification		Lead		Minimum Reporting Limit	
Client	RJ Lee Group	Weight Percent	PPM (ug/g)	Weight Percent	Parts per Million
S1	0392966	< 0.0042	< 42	0.00422	42.2

These results have been validated in accordance with the quality control requirements specified in the analytical method reported above.
These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

Chuck Keida, Laboratory Manager ☐
Brandon J. Miller, Assistant Scientist ☐
Ryan B. Walters, Assistant Scientist ☐
Kimberly S. DiNatale, Scientist ☑
Philip Grindle, Supervisor ☐
Melissa Varner, Assistant Scientist ☐
_____ ☐

Please direct inquiries to Client Services.

Authorized Signature _____
Date 4/15/03

RJ Lee Group, Inc.

Request for Laboratory Analytical Services

Shaded Areas For RJ Lee Gr. Use	Page ____ of ____
Project No.	ACW304520
Client No.	C003032
Date Logged In	By

Purchase Order No. | Client Job. No. Air Force Academy

Date & Time Results Requested
(standard TA assumed if left blank; do not use vague terms like ASAP)

Report Results To

Name	Glenn Ray
Company	Shelby Consulting Services, Inc.
Street Address	P.O. Box 1478
City, State, Zip	Pelham, Alabama 35124
Phone No.	205-664-1313 Fax No. 205-664-1417

If the invoice is to be sent to an address different than the report, please provide the address on the back and check here: ☐

(complete if applicable)
☐ Drinking Water ?
____ State where collected

Analyses Requested
(Enter an "X" in the box below to indicate request; Enter a "P" if preservative added.)

Client Sample Identification	Date Sampled	Matrix / Media	Area / Volume (specify units)	Number of Containers	Total Lead	For Lab Use Only
W1	4/1/03	Soil		1	X	
W2		Wipe		1	X	
W3				1	X	
W4				1	X	
W5				1	X	
W6				1	X	
W7				1	X	
W8				1	X	
W9				1	X	
W10				1	X	
W11				1	X	
W12				1	X	
W13				1	X	

0392966

0392979

Chain of Custody	Relinquished by:	Date/Time	Received at Lab by:	Date/Time
	Method of Shipment: Fed Ex	4/7/3		4/8/03 10:00

Sample Condition Upon Receipt: ☐ Acceptable ☐ Other (explain on reverse)

Disposition of Sample(s): Storage: Date:
Returned: ✓ Date: Method of Shipment:

Prepped by:	Date:	Prepped by:	Date:
Analyzed by:	Date:	Analyzed by:	Date:

Please return completed form to one of the following RJ Lee Group labs:

10503 Battleview Parkway
Manassas, VA 20109
(703) 368 – 7880 Voice
(703) 368 – 7761 Fax

350 Hochberg Road
Monroeville, PA 15146
(412) 325-1776 Voice
(412) 733-1799 Fax

530 McCormick Place
San Leandro, CA 94577
(510) 567-0400 Voice
(510) 567-0488 Fax

14760 Memorial Dr., #106
Houston, TX 77079
(713) 584-0384 Voice
(713) 584-0388 Fax

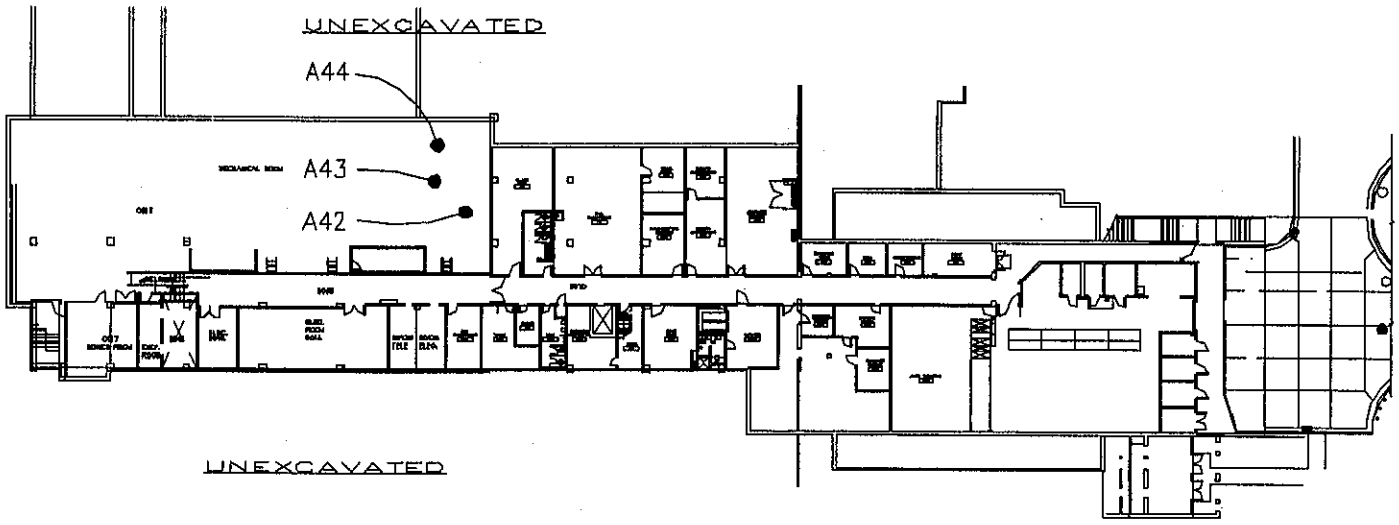
For special instructions (method, detection limits, preservative, etc.) please note on the back and check here: ☐

724

04/15/2003 15:26 7247331799 RJ.LEE → MANASSAS VA. NO.952 0003

APPENDIX 5

SAMPLE LOCATIONS PLANS



LEGEND

A## LOCATION OF MATERIAL SAMPLE WITH NO ASBESTOS DETECTED.

(A##) = LOCATION OF MATERIAL SAMPLE WITH GREATER THAN ONE PERCENT ASBESTOS (i.e. ACM).

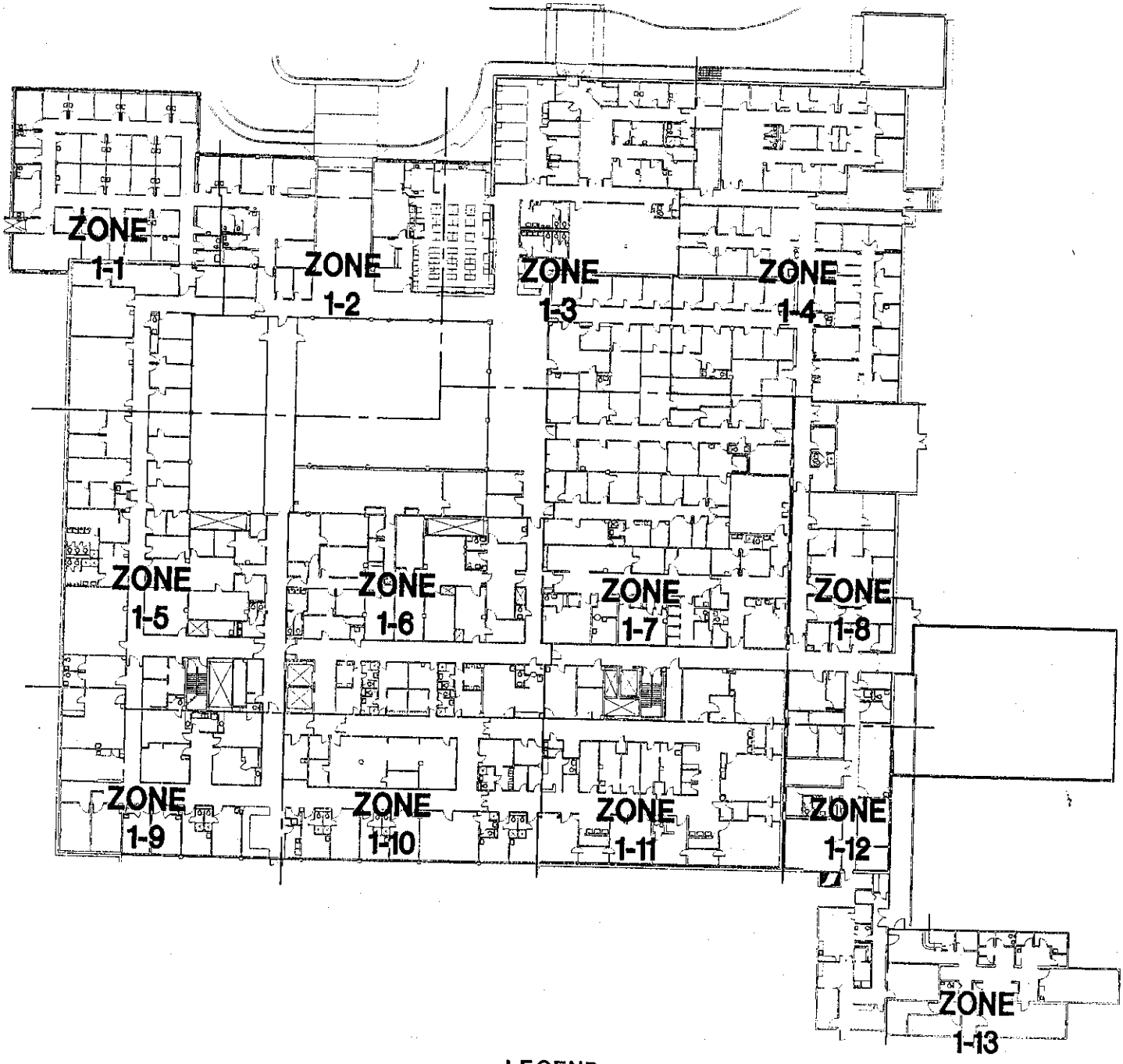
[A##] = LOCATION OF MATERIAL SAMPLE WITH LESS THAN ONE PERCENT ASBESTOS.

XRF## = LOCATION OF ON-SITE PAINT TEST WITH LESS THAN 1.0 MG/CM2 LEAD CONTENT

L## = LOCATION OF PAINT SAMPLE WITH LESS THAN 0.5% LEAD.

(L##) = LOCATION OF PAINT SAMPLE WITH GREATER THAN 0.5% LEAD.

SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD BASEMENT PLAN	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-1



LEGEND

A## LOCATION OF MATERIAL SAMPLE WITH NO ASBESTOS DETECTED.

(A##) = LOCATION OF MATERIAL SAMPLE WITH GREATER THAN ONE PERCENT ASBESTOS (i.e. ACM).

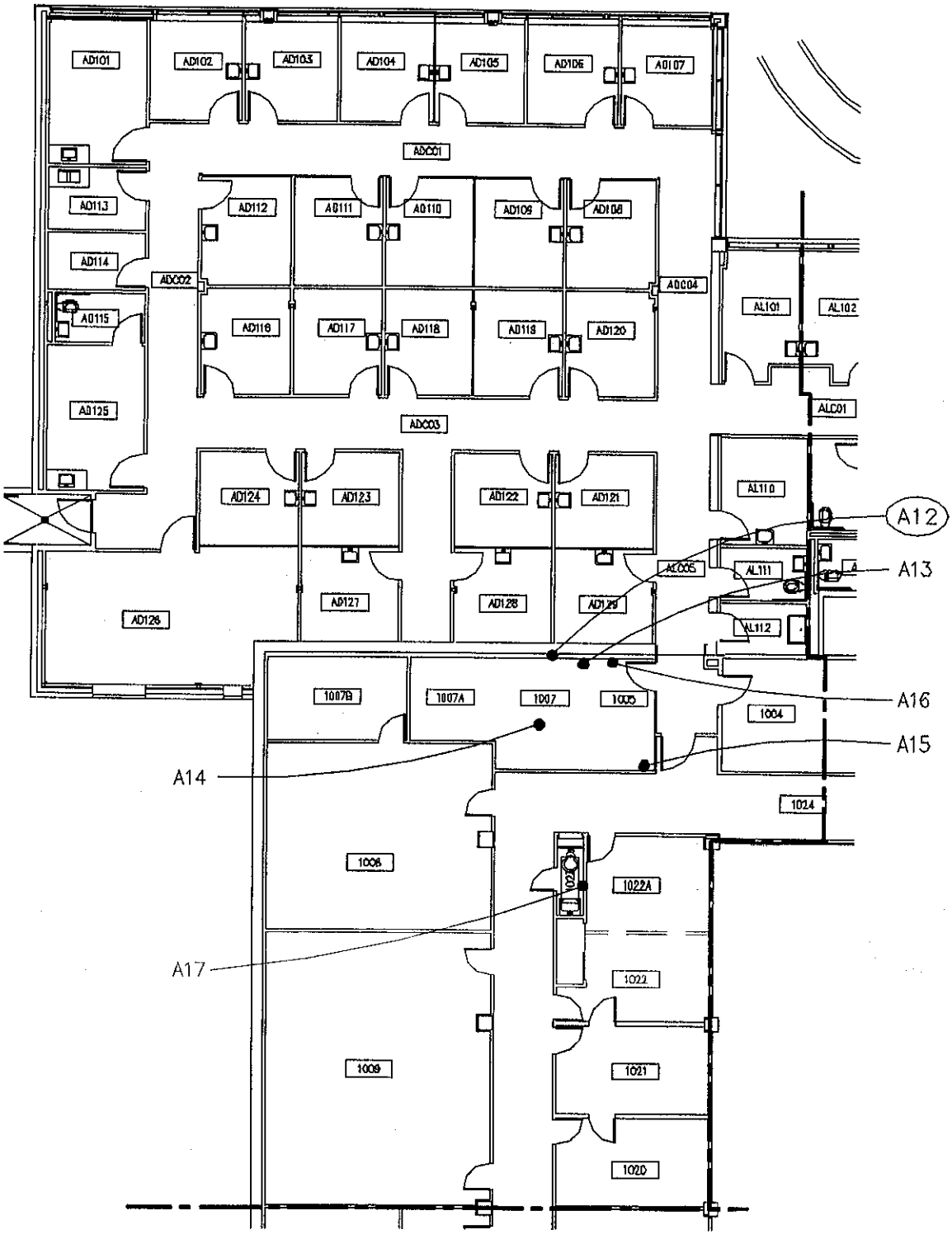
[A##] = LOCATION OF MATERIAL SAMPLE WITH LESS THAN ONE PERCENT ASBESTOS.

XRF## = LOCATION OF ON-SITE PAINT TEST WITH LESS THAN 1.0 MG/CM2 LEAD CONTENT

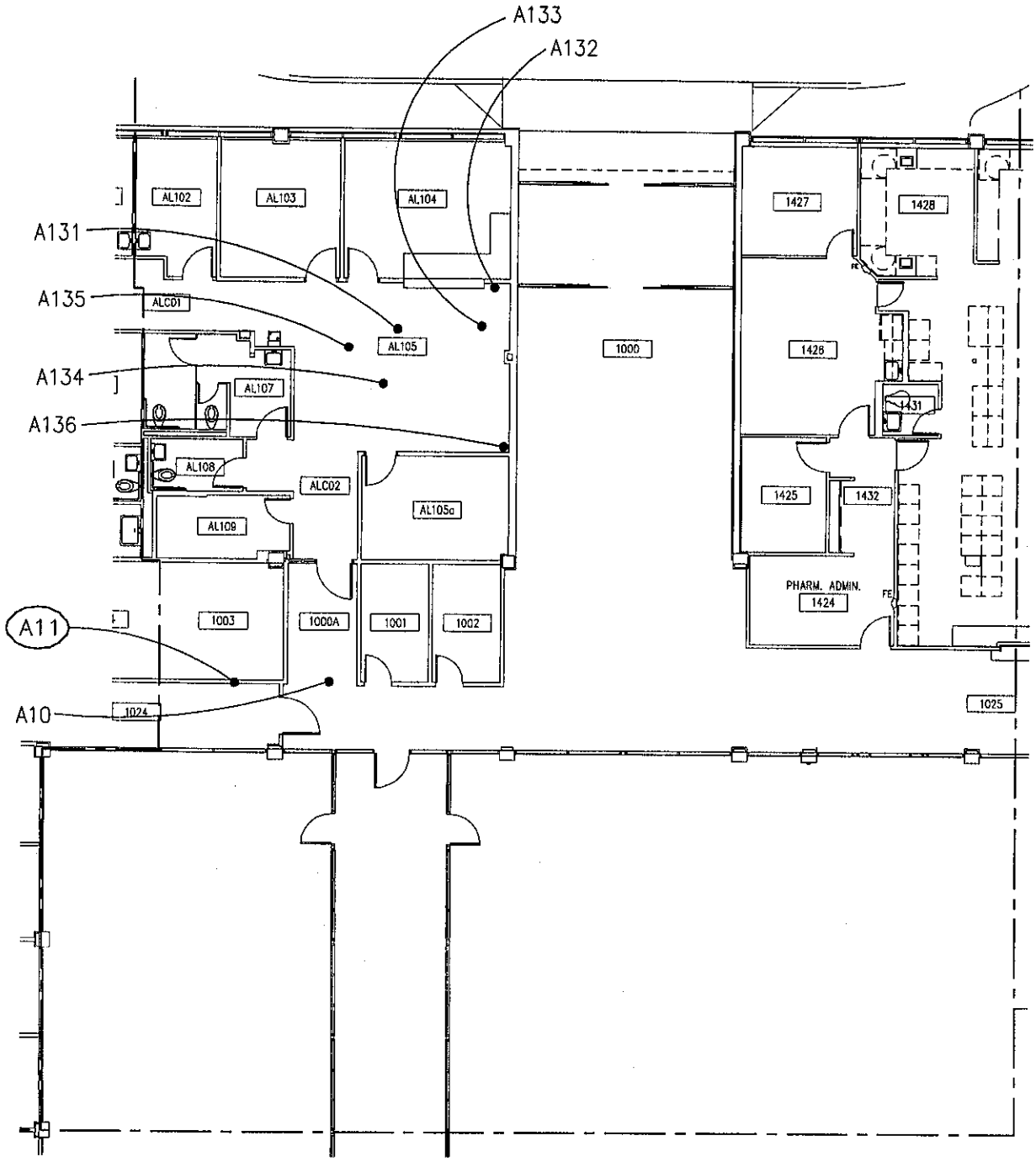
L## = LOCATION OF PAINT SAMPLE WITH LESS THAN 0.5% LEAD.

(L##) = LOCATION OF PAINT SAMPLE WITH GREATER THAN 0.5% LEAD.

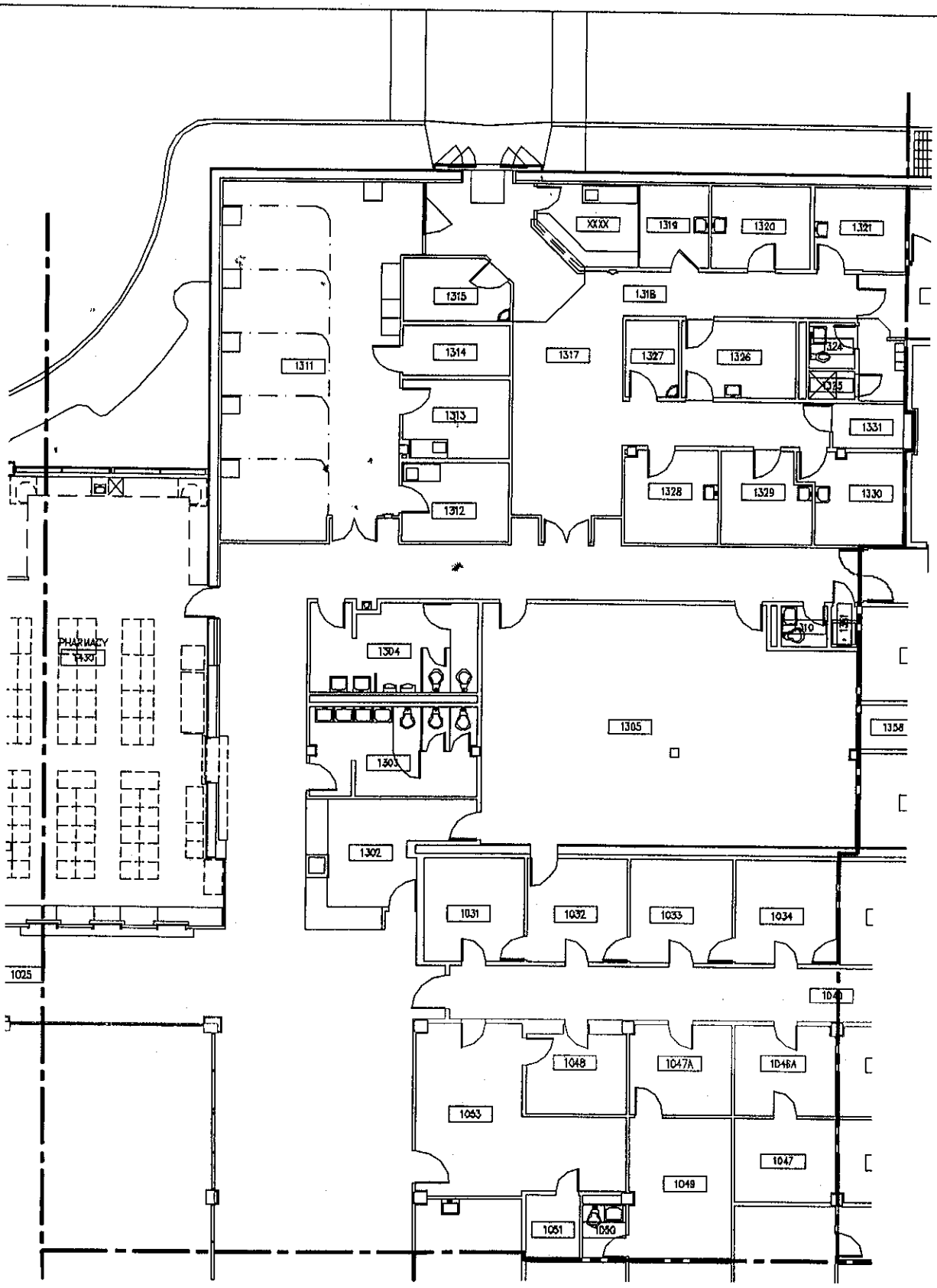
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – KEY PLAN	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-2



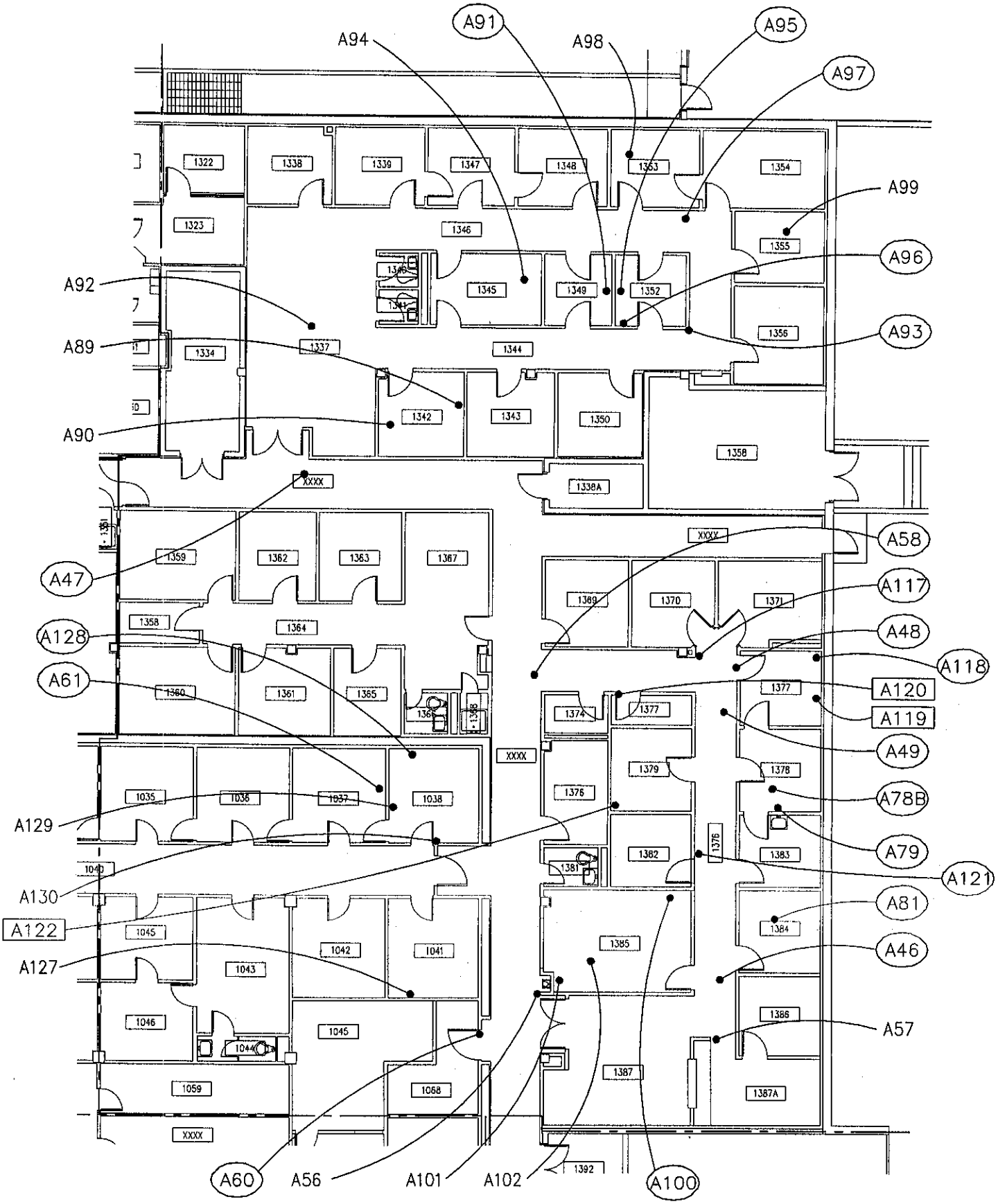
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-1	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-3



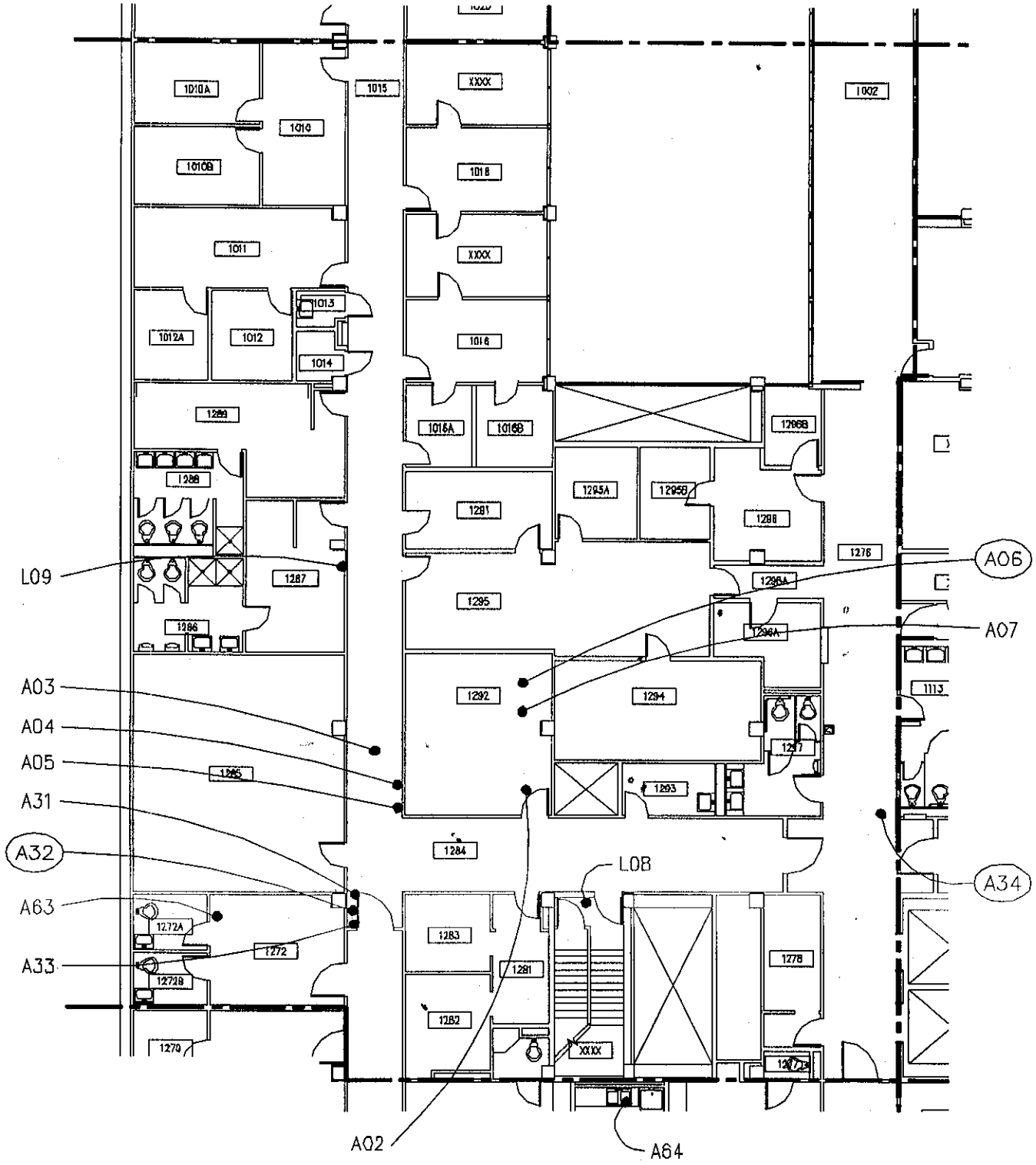
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1–2	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-4



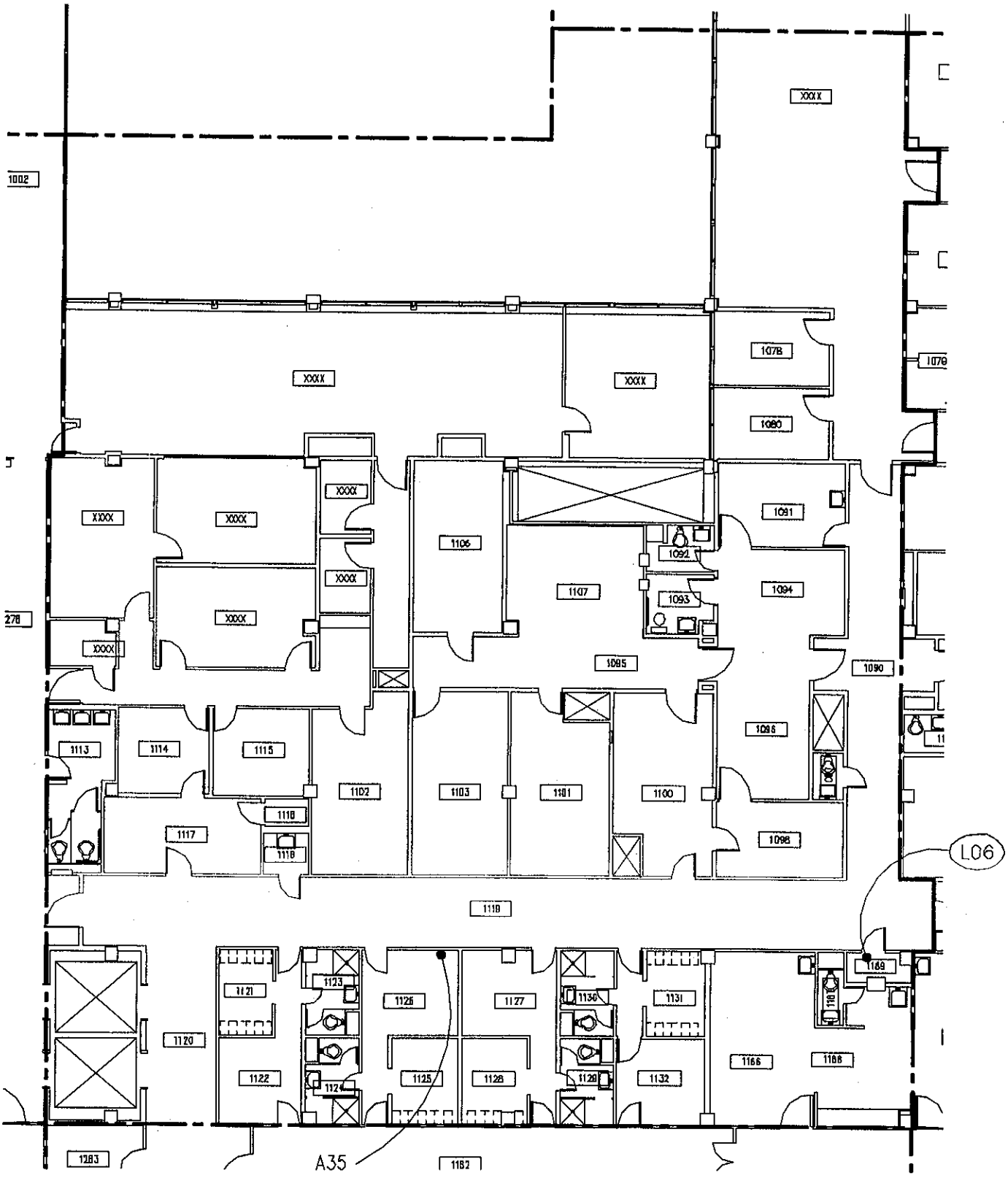
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-3	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-5



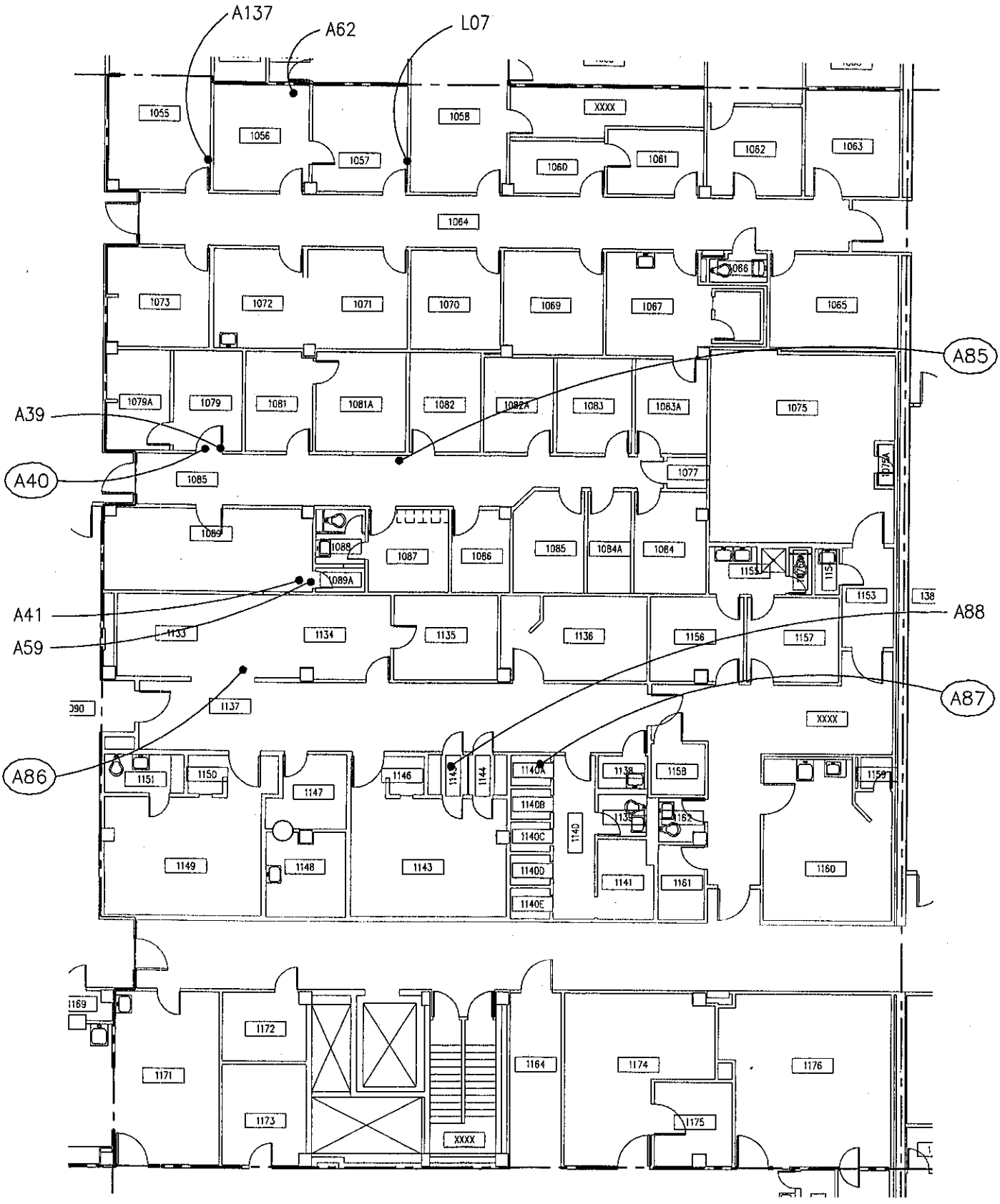
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1–4	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	**5-6**



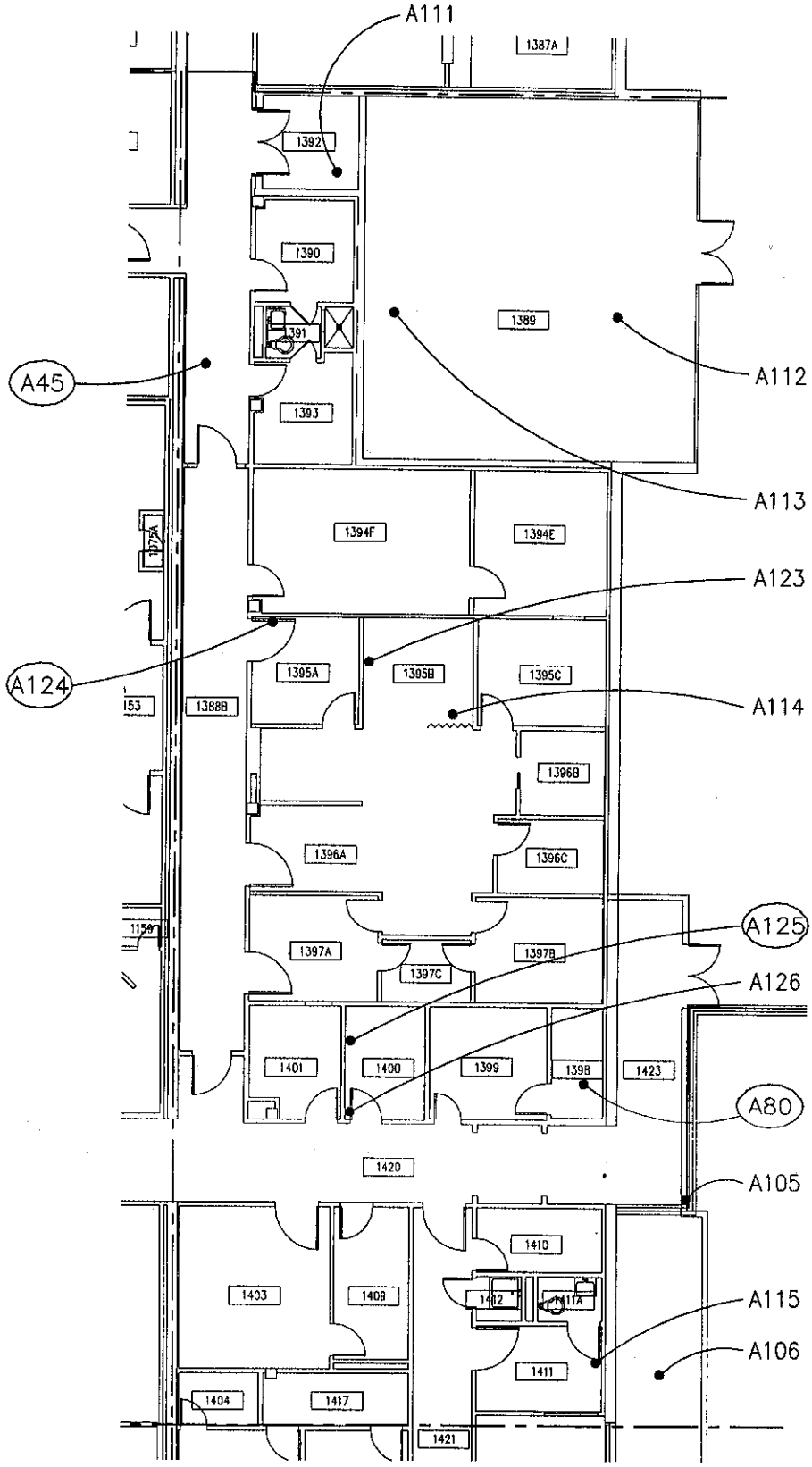
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-5	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-7



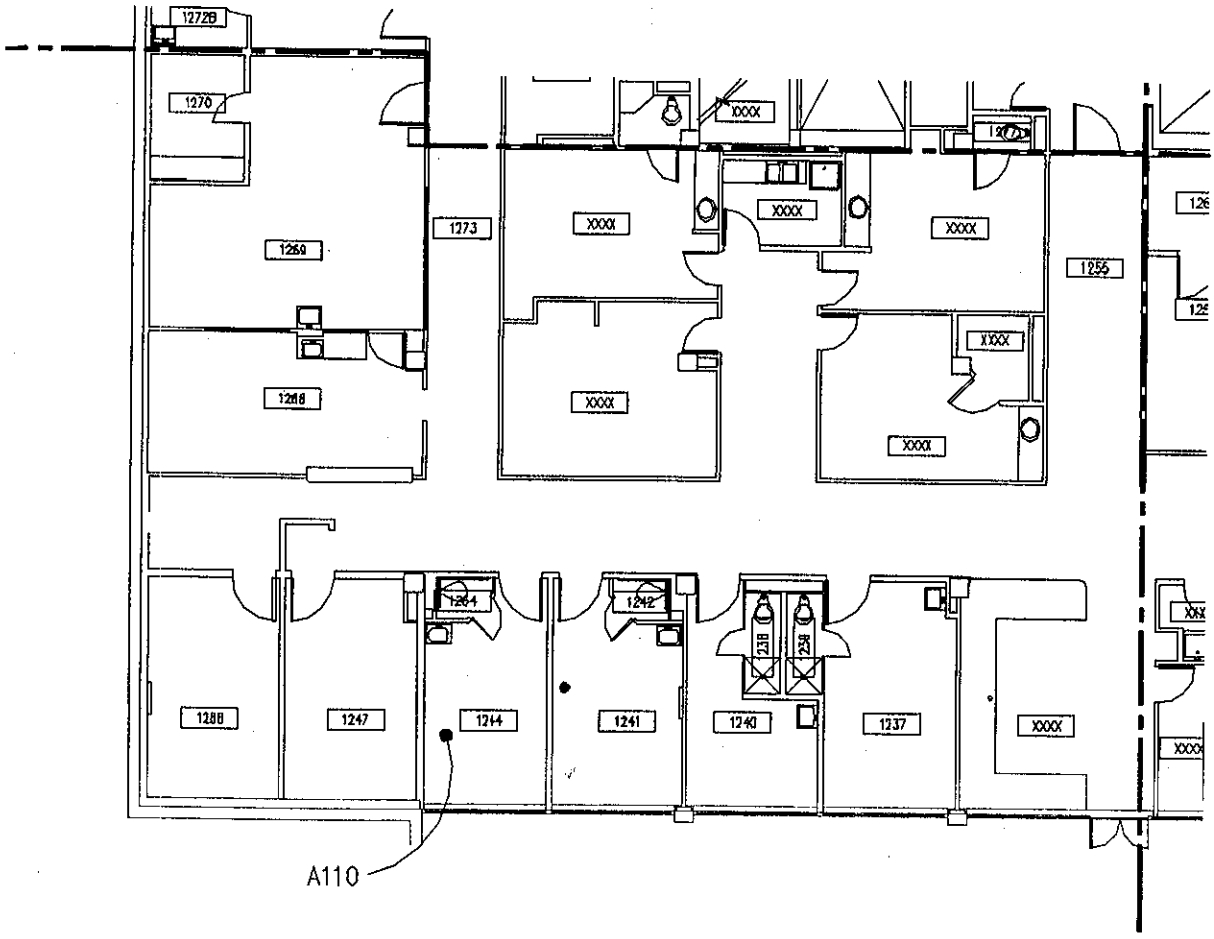
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-6	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-8



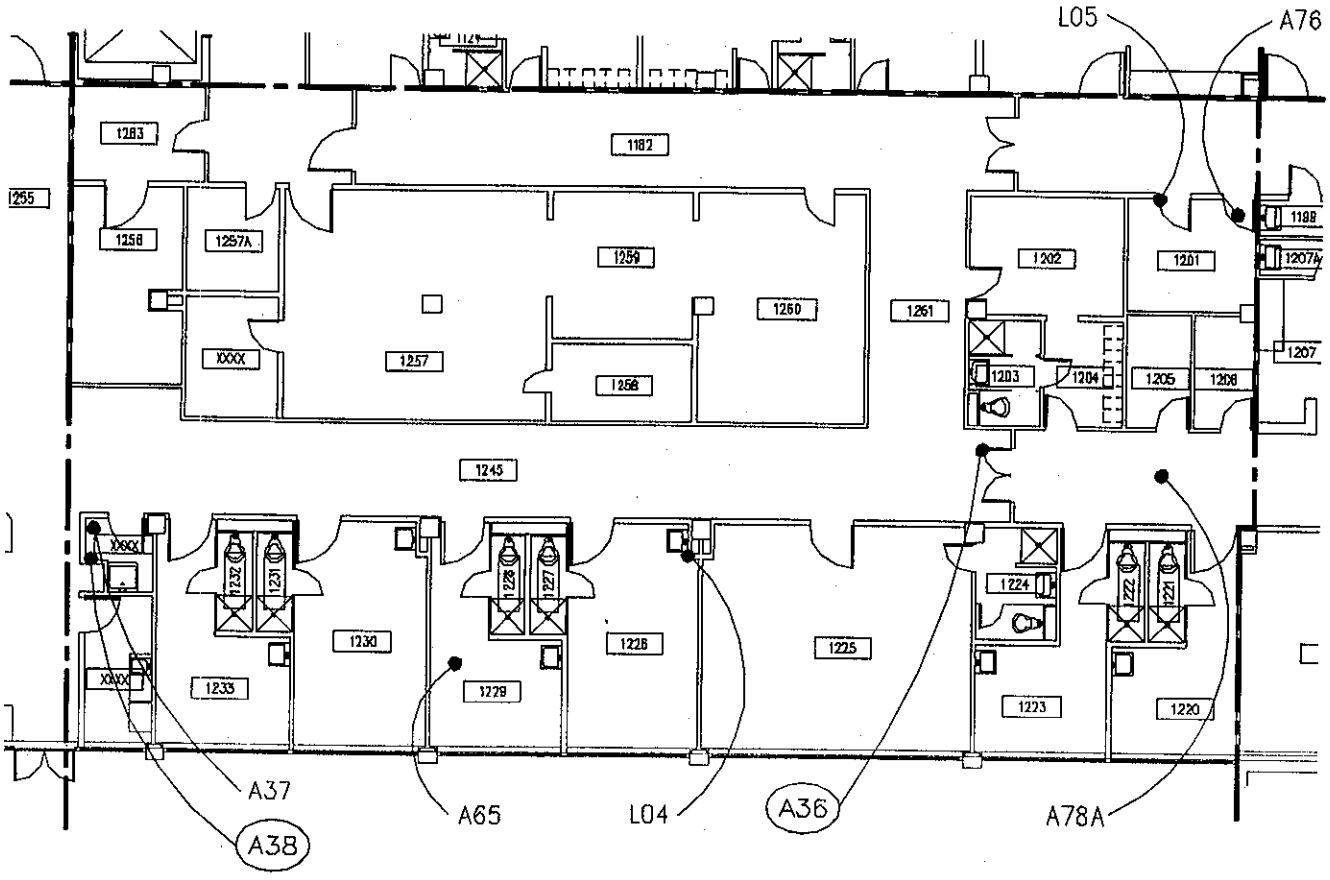
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1–7	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	**5-9**



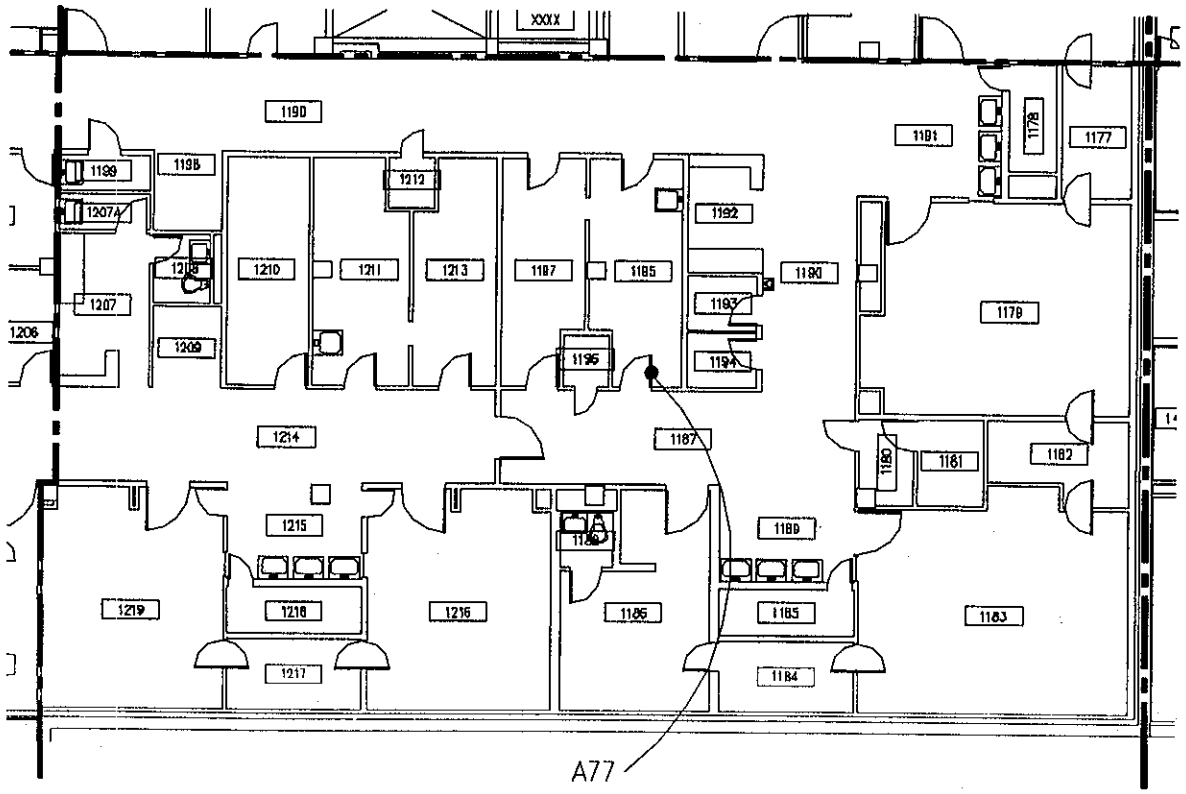
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-8	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	**5-10**



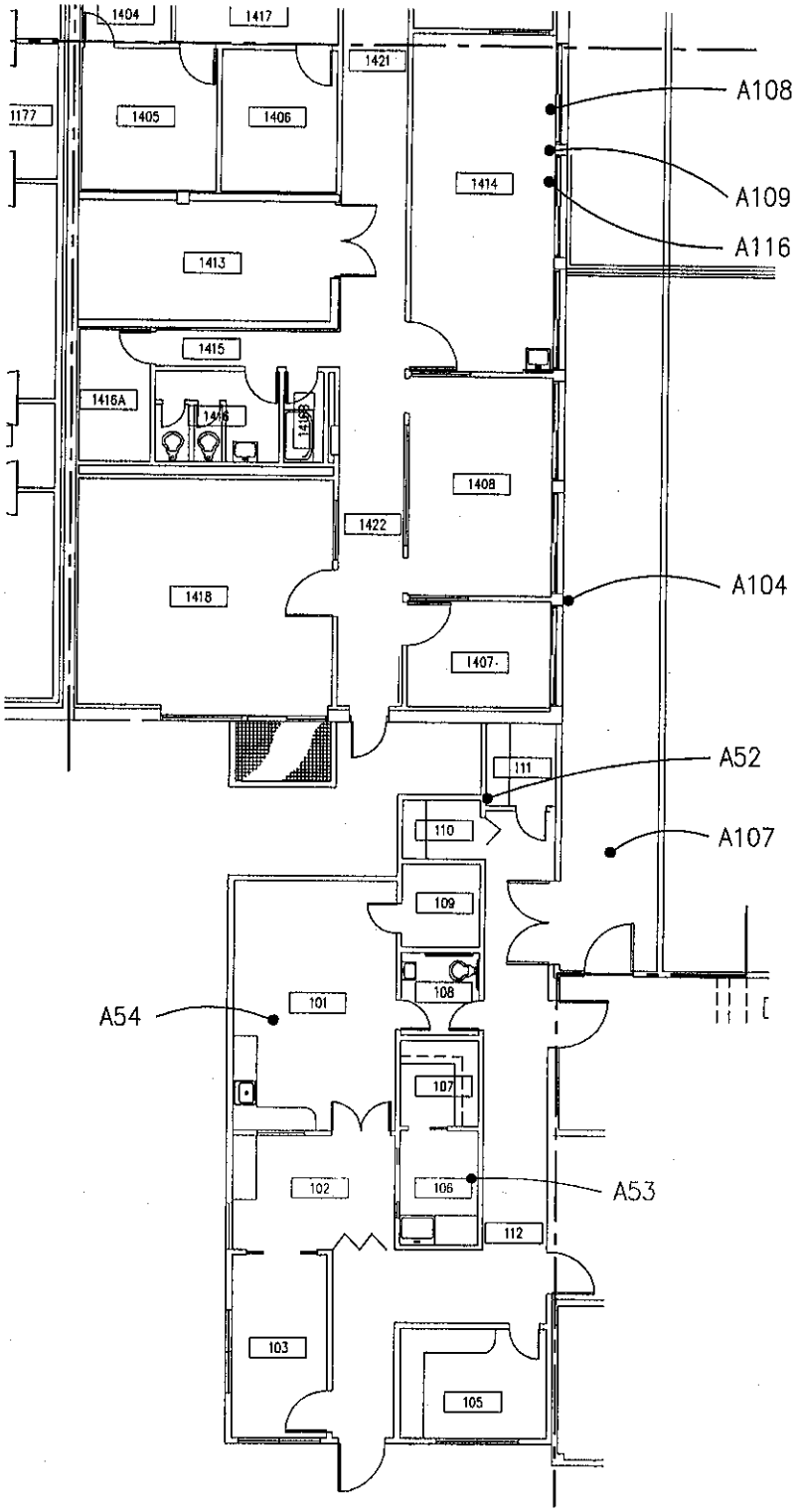
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-9	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-11



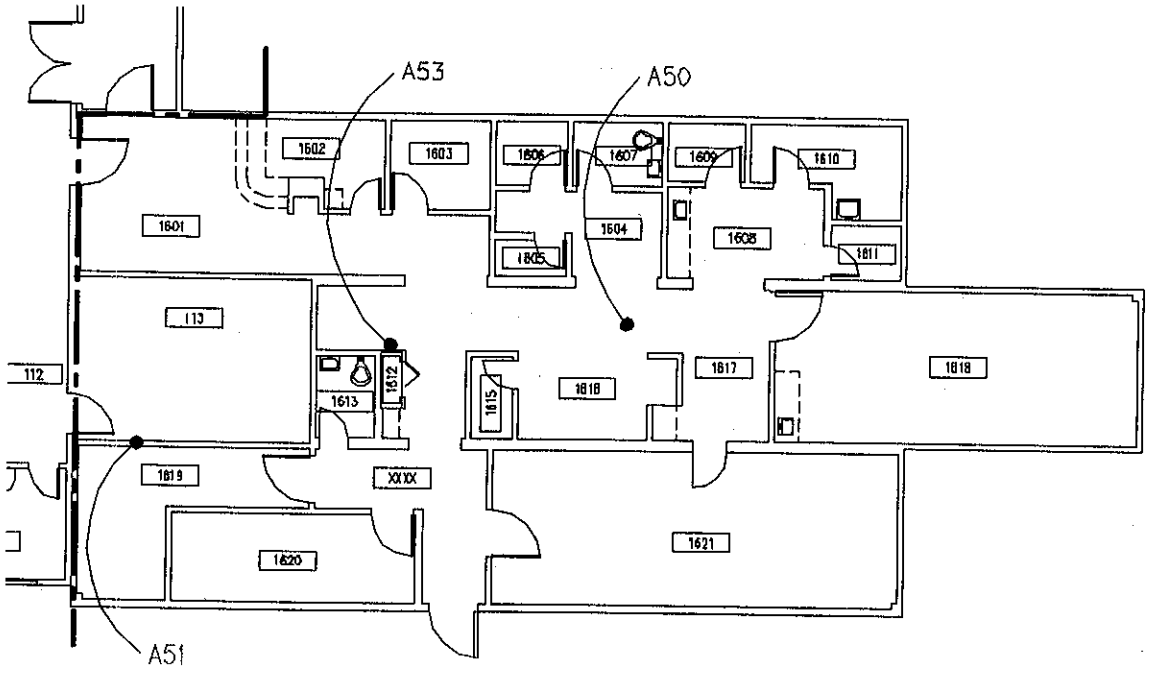
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1–10	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-12



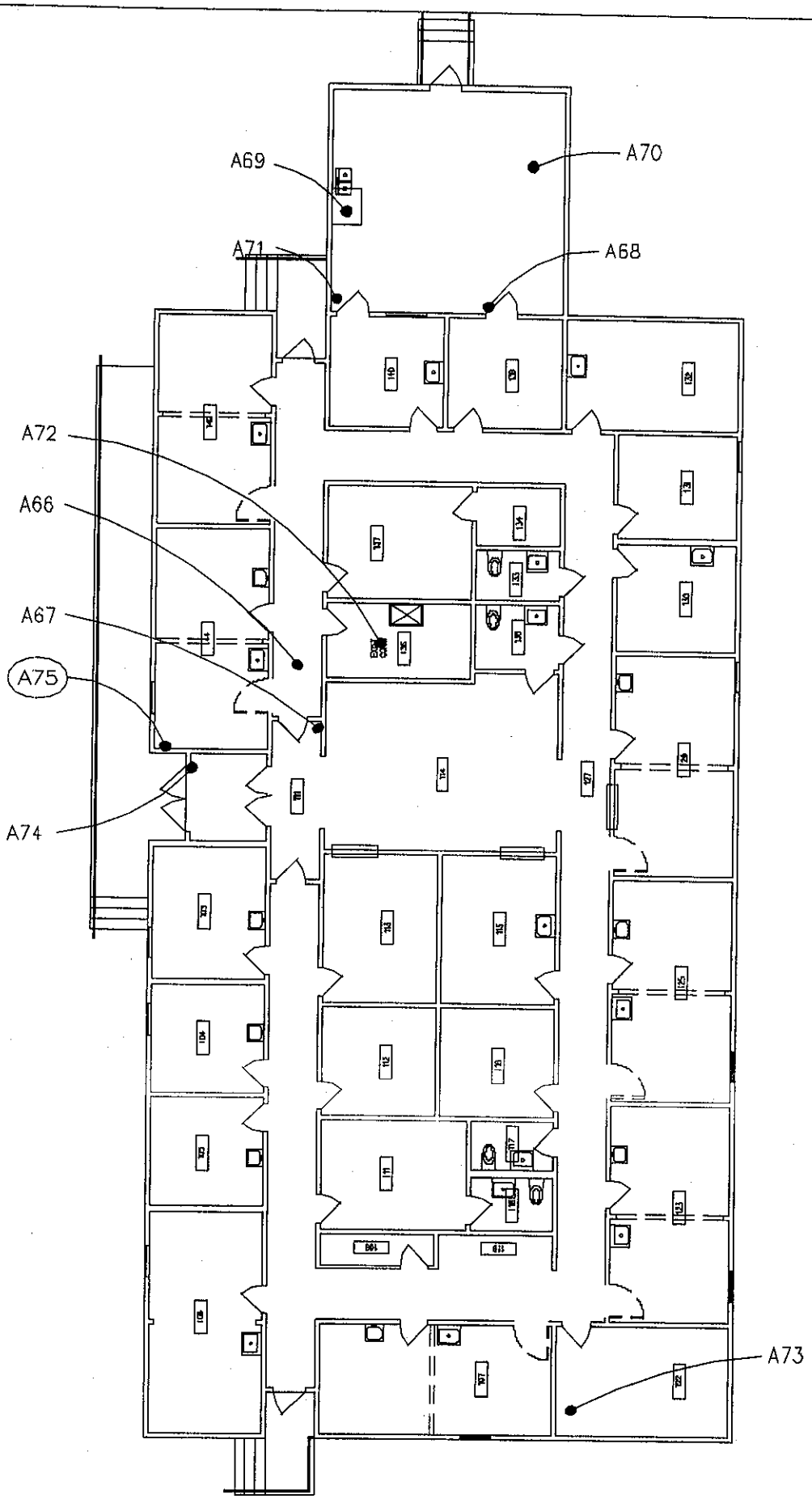
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR - ZONE 1-11	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-13



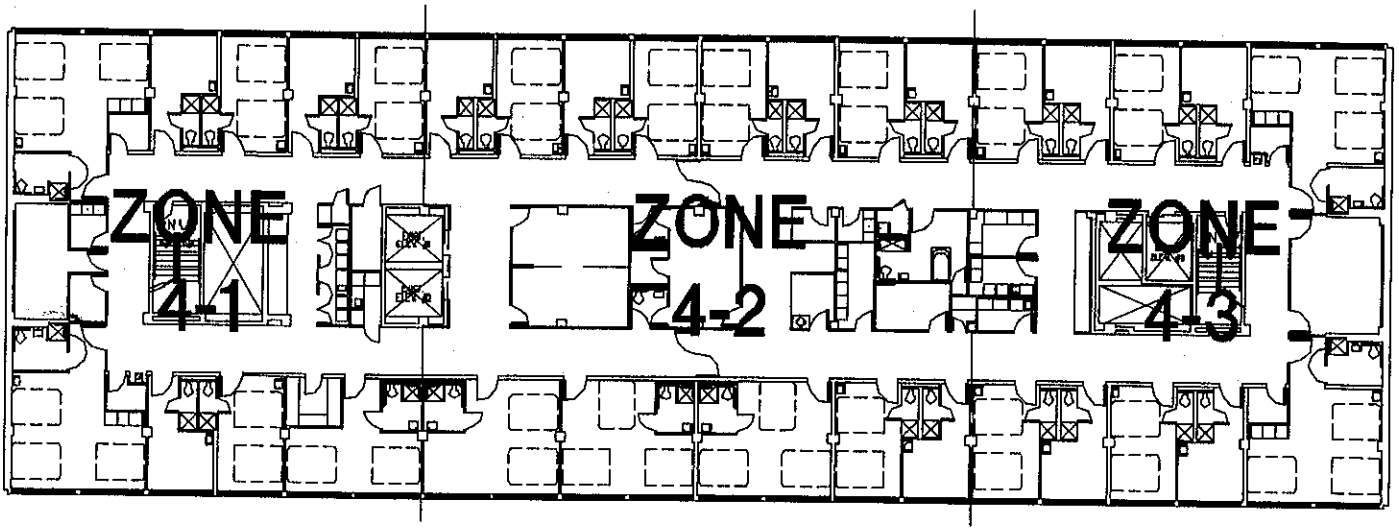
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1–12	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	**5-14**



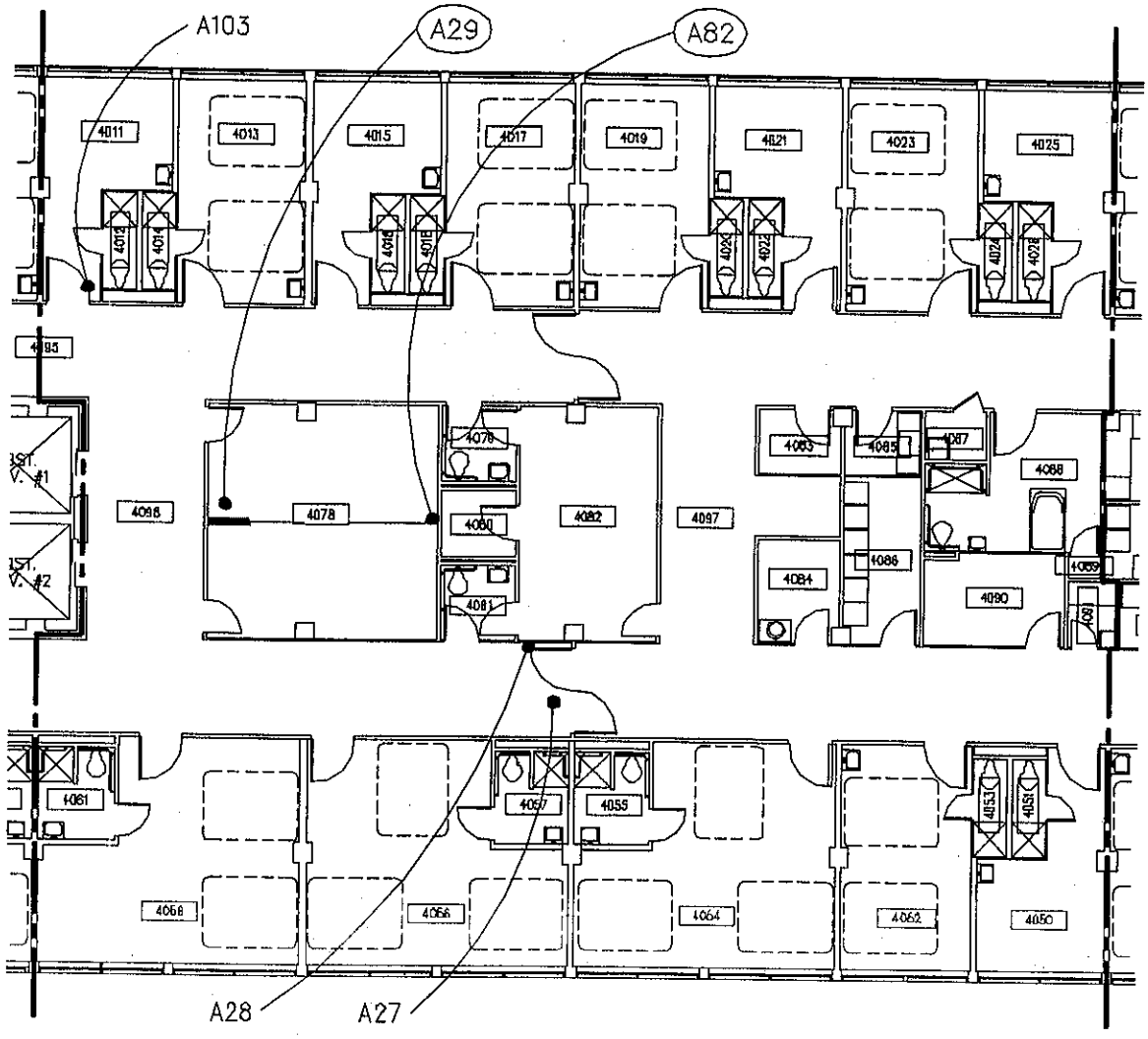
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FIRST FLOOR – ZONE 1-13	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-15



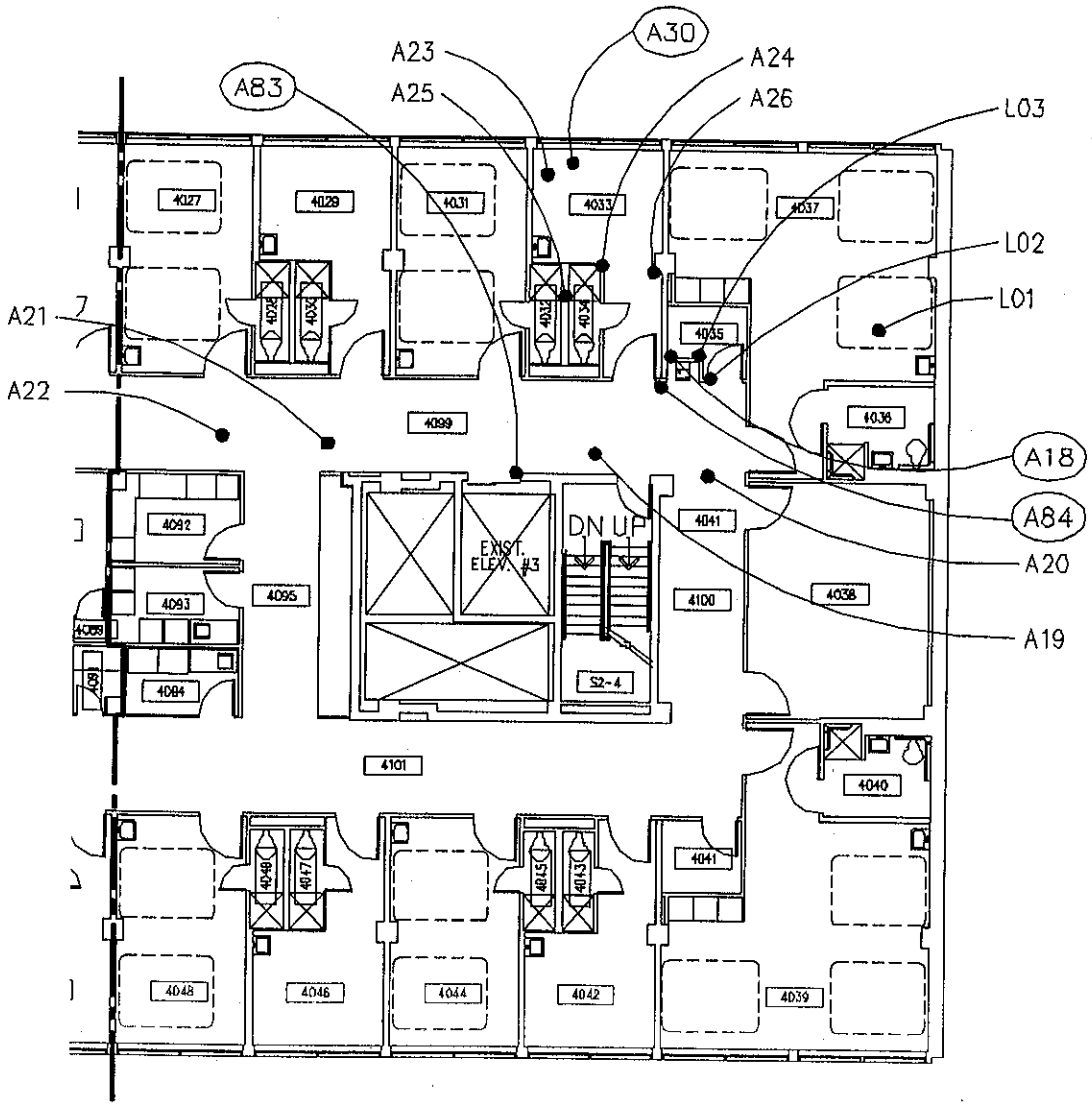
SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD BLDG. 4106/4107 – BLOCK "1V"	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-16



SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FOURTH FLOOR – KEY PLAN	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-17



SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FOURTH FLOOR – ZONE 4-2	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-18



SHELBY CONSULTING SERVICES, INC. HAZARDOUS MATERIAL CONSULTANTS PELHAM, ALABAMA	SAMPLE LOCATION PLAN FOR SUSPECT ASBESTOS AND LEAD FOURTH FLOOR – ZONE 4-3	ASBESTOS AND LEAD SURVEY REPORT AIR FORCE ACADEMY, COLORADO MEDICAL CLINIC ADDITION / ALTERATIONS	5-19

APPENDIX 6

COLORADO CERTIFICATIONS

ASBESTOS CERTIFICATION *

STATE OF COLORADO

Colorado Department of Public Health and Environment
Air Pollution Control Division

This certifies that

N. Glenn Ray

Certification No. 10525

has met the requirements of 25-7-507, C.R.S. and Air Quality Control Commission Regulation No. 8, Part B, and is hereby certified by the state of Colorado in the following discipline:

Building Inspector*

Issued: 01/13/2003

Expires: 01/13/2004

Larry L. Dover
Authorized ~~APCD~~ Representative

** This certificate is valid only with the possession of current AHERA certification in the discipline specified above.*

SEAL

ASBESTOS CERTIFICATION *

STATE OF COLORADO

Colorado Department of Public Health and Environment
Air Pollution Control Division

This certifies that

N. Glenn Ray

Certification No. 10525

has met the requirements of 25-7-507, C.R.S. and Air Quality Control Commission Regulation No. 8, Part B, and is hereby certified by the state of Colorado in the following discipline:

Project Designer*

Issued: 01/14/2003

Expires: 01/14/2004

Larry L. Lovell

Authorized APCD Representative

** This certificate is valid only with the possession of current AHERA certification in the discipline specified above.*

SEAL

APPENDIX 7

DEMOLITION WASTE CLASSIFICATION FOR LEAD

PRELIMINARY LEAD WASTE CLASSIFICATION DATA

ADDITIONS & ALTERATIONS TO
AIR FORCE ACADEMY HOSPITAL

WASTE STREAM # 1:

Uncoated metal items and metal items coated with lead containing paint including but not limited to:

- electrical panels
- electrical conduits
- door frames
- doors
- HVAC ducts and supports
- HVAC pipes and supports
- air handling units and misc. components
- ceiling system grids and supports
- misc. room accessories
- restroom fixtures
- cabinets
- light fixtures
- wall framing
- window frames

Many of these items are not coated (e.g. HVAC ducts) while many others are items that were installed after 1973 and therefore have paints or primers that contain lead in concentrations less than 0.5 % by weight or were installed after 1978 and therefore have paints or primers that contain lead in concentrations less than 0.06 % by weight. Only a small percentage of these metal items have coatings with significant lead concentrations (e.g. door frames representing original construction). Regardless of the lead content on the coatings, these items can be removed with the paint substantially intact and the items relinquished to a metals recycler thereby providing exemption from solid waste regulations. As such no TCLP analysis of metal items will be provided with this report.

WASTE STREAM # 2:

Waste generated by the demolition of walls and ceilings will comprise the overwhelming majority of waste for this project. The electrical systems, plumbing systems, and HVAC systems include a lot of unpainted components which would further dilute the overall lead content of this waste stream, but those items were omitted from this waste stream since most of them are metal and will likely be recycled. However the non-asbestos insulations from those systems are a part of this waste stream. Some of these waste steam #2 materials are not painted (e.g. gypsum backer board behind plaster) and the coatings that are applied to the other materials generally contain

lead concentrations less than 0.5% by weight or less than 0.06% lead by weight. In fact the highest actual test result for these materials was 0.12%. For purposes of this preliminary lead waste classification we are using an average of 0.06% lead by weight or the equivalent 600 parts per million (ppm) for all coated wall and ceiling demolition waste materials.

1) Gypsum Wall Board: Almost all walls in the various building additions are constructed of painted gypsum board that was installed after 1978 and therefore by law the paints cannot have lead in excess of 0.06% or 600 ppm. Also many of the older walls in the original building areas and the 1968 addition have had gypsum applied over the original wall material since 1978. These calculations assume that the gypsum wall boards when installed required two coatings of 1.5 mil dry film thickness per coating and given their age have not been repainted.. This assumption produces 2 coatings multiplied by 1.5 mils (0.0015 inches) equals a wall paint thickness of 3 mils (0.003 inches) applied to 0.625 inch thick gypsum board containing 0.00 % lead producing a total gypsum and wall paint thickness of 0.628 inches. The paint thickness of 0.003 inches with 600 ppm lead is 1/209 of the total wall thickness of 0.628 inch. 600 ppm divided by 209 wall thickness units produces 2.87 ppm lead per gypsum wall waste unit.

2) Plaster Walls & Ceilings: Many of the original building areas to receive demolition currently have plaster walls and some have plaster ceilings constructed of approximately 1.00" plaster on metal lath applied to 0.5" gypsum backer board. These calculations assume that the original plaster construction required two coatings of 1.5 mil dry film thickness per coating and that most plaster has since been painted two times with coatings of 1.5 mil dry film thickness each. This assumption produces 4 coatings multiplied by 1.5 mils equals a wall paint thickness of 6 mils (0.006 inches) containing 600 ppm lead. The paint applied to the plaster and gypsum backer system of 1.5" containing 0.00 ppm lead produces a total plaster system of 1.506". The paint thickness of 0.006 inches with 600 ppm lead is 1/251 of the total wall thickness of 1.506". 600 ppm divided by 251 wall thickness units produces 2.39 ppm lead per plaster/gypsum wall waste unit.

3) Clay Tile Block & Plaster Walls: Many walls in the original part of the building are clay blocks with plaster surface. Six inch unpainted clay blocks compressed to delete cells equal approximately 3" thickness plus 1" plaster produces 4 inch total unpainted wall thickness. These calculations assume that the original plaster construction required two coatings of 1.5 mil dry film thickness per coating and that most plaster has since been painted two times with coatings of 1.5 mil dry film thickness each. This assumption produces 4 coatings multiplied by 1.5 mils equals a wall paint thickness of 6 mils (0.006 inches) containing 600 ppm lead. Add the paint to the wall and produce a total thickness 4.006 inches. The paint thickness of 0.006 inches with 600 ppm lead is 1/668 of the total wall thickness of 4.006". 600 ppm divided by 668 wall thickness units produces 0.90 ppm lead per clay/plaster wall waste unit.

4) Acoustical Tile Ceilings: The remaining ceilings are predominately lay in acoustical tile systems which are assumed to be 0.625" thick with 600 ppm lead and a single coating of 1.5 mil (0.0015") producing a total acoustical ceiling of thickness of 0.627 inches. The paint thickness of 0.0015 inches with 600 ppm lead is 1/418 of the total ceiling thickness of

0.627". 600 ppm divided by 418 ceiling thickness units produces 1.44 ppm lead per ceiling tile waste unit.

The following waste ratios are used for the four types of products comprising waste stream #2 as follows:

WASTE STREAM # 2				
MATERIAL TYPE	% OF TOTAL WASTE	WASTE UNITS AS PART OF TOTAL 10 PART SYSTEM	LEAD PER WASTE UNIT	TOTAL LEAD (WASTE UNITS X LEAD PER UNIT)
GYPSUM WALLS	25%	2.5	2.87	7.18 PPM
PLASTER / GYPSUM WALLS	25%	2.5	2.39	5.98 PPM
PLASTER / CLAY BLOCK WALLS	25%	2.5	0.90	2.25 PPM
ACOUSTICAL CEILING TILES	25%	2.5	1.44	3.60 PPM
TOTAL LEAD				19.01 PPM
LEAD AVERAGE 19.01 PPM / 10 WASTE UNITS				1908 PPM

Based upon the dilution rates used in the TCLP method it would be mathematically impossible for 1.90 ppm total lead to produce 5.0 ppm leachable lead.